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THE

FUR SEALS AND FUR-SEAL ISLANDS

OF THE

NORTH PACIFIC OCEAN.

BY

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PART IV.

THE ASIATIC FUR-SEAL ISLANDS AND FUR-SEAL INDUSTRY.

BY

LEONHARD STEJNEGER,
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A.–

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A.—THE RUSSIAN FUR-SEAL ISLANDS, 1741-1897.

I.—INTRODUCTION.

The following treatise is based upon observations gathered during four different visits to the Commander Islands, off the coast of Kamchatka, the first undertaken in 1882–83, during the palmiest days of the fur-seal industry, the second during 1895, as a special attaché of the United States Fish Commission, to study the recent decline and to compare the conditions as I knew them thirteen years ago with those of the present day. My third trip took place in 1896, by direction of the President, pursuant to the joint resolution of Congress approved June 8, 1896, and the fourth one in 1897 under the same auspices.

In the introduction to my report of the expedition in 1895 I made the following statement:

I undertook the trip with a full understanding of the difficulties awaiting me, both in the studies in the field and in the working up of the report. I was fully aware that, alone in an almost untrodden field, my work would of necessity be fragmentary, and for that reason unsatisfactory. Nevertheless, I felt that I ought to do it for several reasons. In the first place, I was in possession of a great amount of interesting information about the Russian seal islands never published, or else very inaccessible to those concerned in the fate of the fur-seal, which it might be useful to bring together. In the second place, I felt convinced that but few men were in the same fortunate position as myself of having had the opportunity to study the Russian fur-seal industry at close quarters while it was still flourishing, and that consequently I was in an exceptionally good position for instituting the desired comparison.

Finally, I reflected, having kept aloof from all the strife and controversy of recent years concerning seal matters, because I had no pet theories of my own to ventilate nor any personal interest of myself or friends to advance, I would be less liable to suspicion of being prejudiced or biased by any outside motive. I have earnestly endeavored to preserve this independence, personal and scientific, in the investigations which I have undertaken, and I claim that the conclusions I have reached are based upon the facts as I have been able to discern them. It is my hope that the logic of my deductions will not be found lacking.

The third visit was necessarily a very brief one, chiefly in order to supplement the information gathered previously. During this trip, however, Robben Island was also visited. The fourth journey was more protracted. Its chief object was to determine the extreme ratio between the sexes, and its results are conclusive.

SCOPE OF THE WORK.

It has been considered advisable to combine the reports for 1896 and 1897 with the general account of "The Russian Fur-Seal Islands," which was published by the United States Fish Commission, so as to bring the whole subject up to date.

At the suggestion of Mr. Richard Rathbun, in charge of the scientific inquiry of the Fish Commission, and with the approval of the Acting Commissioner of Fisheries, Mr. Herbert A. Gill, the scope of the 1895 report was extended so as to include all other obtainable information concerning the Russian seal islands, and it has thus assumed somewhat the character of a monograph. But I wish it distinctly understood that it does not pretend to exhaust the subject in any direction. Some of the chapters are only brief résumés, thus causing great inequality in the treatment of the various questions. This could not well be otherwise, for it would have been manifestly impossible to prepare a work of that scope, with all the labor and research it involves, in the short time of three and one-half months which I have had at my disposal for writing this treatise. Moreover, such an exhaustive work could not be done here in Washington or even in this country. It would have been necessary to consult records and archives in San Francisco and in St. Petersburg, as well as the libraries in the latter city.

In preparing that work I have had the hearty cooperation of the authorities of the United States Fish Commission, and I wish particularly to express my grateful appreciation of the truly scientific spirit and liberality shown by Mr. Rathbun in giving me every possible latitude for working out the problems in my own fashion without attempting to influence my opinion in any direction. His only injunction to me has been a desire for the facts as I have seen them. It has been my endeavor to supply them to the best of my ability.

ITINERARY.

My first visit to the Commander Islands was undertaken in March, 1882, under the joint auspices of the Smithsonian Institution and the United States Signal Service. With a notice of only two days, I left Washington on March 22, 1882, and sailed from San Francisco in the *Aleksander II* the following April 5, landing on Bering Island a month later—on May 7. During the summer I studied the fur-seals and rookeries on this island. In the fall of 1882 I undertook a circumnavigation of Bering Island in open boat, returning to the village after a successful trip of two weeks. The winter was passed on Bering Island, but part of the following summer, particularly the sealing season, I spent on the various rookeries of Copper Island. In October, 1883, I took passage in the *St. Paul* from Petropaulski, Kamchatka, to San Francisco, arriving in Washington the following November 26. The results of this trip have been published in numerous memoirs and papers, mostly issued by the United States National Museum.

The itinerary of my trip in 1895 is as follows: After receiving my appointment on May 21, I left Washington on May 28, with letters from the Russian legation, authorized telegraphically by the authorities in St. Petersburg, and arrived in San Francisco on Sunday, June 2. Various preparations for the journey occupied me until June 6, when I sailed in the steamship *Bertha* for Unalaska. In this port I was to join the Fish Commission steamer *Albatross*, which, it was calculated, would have returned to Unalaska from its first trip to the Pribilof Islands at the time I was due there. In such an event Captain Drake had orders to bring me to Bering Island via the Pribilofs, in order to afford me an opportunity to witness and compare the mode of driving the seals on both groups. Upon my arrival at Unalaska on June 17 I found, however, that the *Albatross* had only arrived there the day before, without having as yet been to the Pribilofs. The following week was consumed in Unalaska taking in coal. The *Albatross* left Unalaska on June 23, and on June 25 we were landed at the village, St. Paul Island. The rookeries near the village were inspected the same afternoon.

Thanks to the zeal and courtesy of the Treasury agent, Mr. J. B. Crowley, and the company's general agent, Mr. J. Stanley-Brown, a small drive of seals was at once arranged for the following morning. Mr. F. W. True, of the United States National Museum, and I partook in the drive, which lasted from 2 o'clock in the morning to 10 a. m. At 1 p. m. I embarked again on the *Albatross* and steamed at once away for Bering Island; anchored off the main village on July 3, and on the 4th, with Captain Drake and Mr. C. H. Townsend, went per dog-sledge to the great North Rookery. After having landed my effects, the *Albatross* left on the following day.

My next trip to the North Rookery was per boat, in company with Governor Grebnitski, on July 7. On July 15 I again proceeded to the same rookery in dog-sledge, returning to the main village by the same means July 20. Bad weather prevented the carrying out of my intentions of visiting the South Rookery at this time. On July 27 I took passage on the Russian Seal Skin Company's steamer *Kotik*, Capt. C. E. Lindquist, for Copper Island, and on July 30, in company with the governor, Mr. Grebnitski, who bore the expense of the trip, started from the main village on an open-boat expedition around the island. Spent the evening and the next morning at the sea-otter rookery. July 31 and August 1 were devoted to inspecting and photographing the Karabelni rookeries and August 2 to 11 to the Glinka rookeries, the latter being the more important ones, finishing the circumnavigation August 12. On the steamer *Kotik* I then returned to Bering Island, anchoring off the North Rookery August 13. Visited the South Rookery August 17, securing photographs and a map of the rookery. On August 18 I called on board the British cruiser of the third class *Porpoise*, Commander Francis R. Pelly (doing patrol service on the 30-mile limit), then at anchor off Nikolski. On August 21 I went in dog-sledge to the North Rookery, returning two days later. The captain of the *Porpoise* having kindly offered to take me to Petropaulski, I gladly accepted his offer, as it was somewhat doubtful whether the *Kotik*, in which I intended to return to San Francisco, would be able to call at the islands before going home, and I did not dare to risk the possibility of wintering on Bering Island. I arrived in Petropaulski August 25. The company's agent having decided to make another trip to the islands, I returned in the *Kotik*, and was thus enabled to again inspect the Bering Island South Rookery on September 9 and the North Rookery September 16, being back in Petropaulski September 18, which port I left on September 24 in the *Kotik*, bound for San Francisco, where I arrived on October 11.

The weather was unprecedentedly stormy and rainy during my entire stay at the islands and interfered greatly with my work. The great distances between the habitations and the rookeries and the primitive means of transportation also added to the difficulties, while much valuable time was lost owing to the uncertainty of the movements of the steamer.

Under such adverse circumstances I should have been unable to accomplish even what I did had it not been for the kind assistance I received on all sides.

The itinerary for 1896, in so far as it relates to the Russian Fur-seal Islands, is as follows: Leaving Dr. Jordan and his associates of the Fur-Seal Investigation

Commission, as well as the British commissioners, on St. Paul Island, Lieut. Commander J. F. Moser, U. S. N., commanding the *Albatross*, I proceeded on July 23 in that vessel to the Commander Islands, after having coaled in Dutch Harbor, Unalaska. On July 30 we anchored off Preobrazhenskoye village, Copper Island, but being informed that Mr. Grebnitski, the administrator of the islands, was in Nikolski, Bering Island, we proceeded to that place, arriving there the next morning.

Having received Mr. Grebnitski's permission to visit the rookeries, I inspected and photographed South Rookery, Bering Island, August 1. The Copper Island rookeries were next examined under very unfavorable weather conditions. Returning to Bering Island, the North Rookery was photographed in a gale of wind accompanied by rain on August 8. It being impossible to make a landing at Nikolski the next day, course was set for Kamchatka, as it was necessary to stop at Petropaulski in order to coal. This accomplished, and having examined the rocks and islands in the Kuril Archipelago, belonging to Japan, the *Albatross* came to anchor off Robben Island, in the Sea of Okhotsk, on August 28. The next day and August 31 were spent on that rock observing and photographing. After a second visit to the Kurils for further information, we anchored in Hakodati, Japan, September 10. I arrived in Washington December 22, 1896, having been absent six months and four days.

My itinerary for 1897 is as follows: Leaving Washington on June 5, I arrived in Tacoma, Wash., on June 12, whence, on the following day in company with Mr. F. A. Lucas, I proceeded in the steamship *City of Topeka* to Sitka, Alaska. Upon our arrival there, June 20, I at once embarked in the U. S. revenue cutter *Grant*, Capt. F. M. Munger commanding. Departed from Sitka the following morning; arrived in Unalaska June 27. After coaling, the *Grant*, on the 30th, proceeded to the Commander Islands, landing me at Nikolski, Bering Island, on July 7. The British commissioner, Prof. d'Arcy Thompson, arriving on July 11, he, Mr. Barrett-Hamilton, and myself proceeded per dog-sledges to the North Rookery, 12 miles distant, making an examination of the condition of this rookery. Professor Thompson them departed for Copper Island, while Mr. Barrett-Hamilton and I remained on Bering Island, deeming the closer inspection of the rookeries of the latter island, particularly the South Rookery, of higher importance. Neither the administrator nor the assistant administrator having as yet arrived on the islands, it was considered best to await the arrival of the latter, Mr. N. S. Wachsmuth, in order to obtain the necessary permission for a protracted stay and thorough examination of the South Rookery. In the meantime Mr. Barrett-Hamilton and I undertook another dog-sledge expedition to the North Rookery on July 16, which was in every way satisfactory. Upon Mr. Wachsmuth's arrival we commenced to make the necessary preparations for the trip to the South Rookery. A boat and crew was obtained with some difficulty; tents rented and camp equipage purchased, and on July 19, in the morning, we set out for the South Rookery. Although only 20 miles from Nikolski, it took five days to get there on account of stress of weather. The nights we had to pass on the beaches, sleeping under the overturned boat. Wet and worn, we landed at the rookery on July 24, and went at once into camp. Until the 30th we studied this rookery every day very carefully at all stages of the tide and in all kinds of weather, and a satisfactory count of the pups was made. On the latter date the Imperial Russian steamship *Yakut* arrived off the rookery, announcing the arrival in Nikolski of Mr. Grebnitski, the administrator, and offering to give us passage to the village, an offer we gladly accepted as our best chance of returning from the rookery. Upon meeting Mr. Grebnitski he expressed a desire to have me go to the North Rookery with him by boat, and as I was informed that H. B. M. S. *Linnet*, which in the meantime had come to convey Mr. Barrett-Hamilton to Copper Island, had no further accommodations, I decided to wait for the next Russian cruiser, and meanwhile to accompany Mr. Grebnitski to North Rookery. Press of other official business and unpropitious weather prevented the plan of visiting the North Rookery from being carried out, and on the 15th August I consequently availed myself of the kind offer of the captain of the imperial Russian cruiser *Koreets* to give me passage to Copper Island, where I was landed on the following day at Preobrazhenskoye village. It being deemed impracticable to land at the rookery villages then on account of the surf, it mattered very little that no boat could be obtained until the 19th, on which day I hired a boat and crew, arrived the day previous, and sailed to Glinka the same day. The Glinka rookeries were examined during the following days, but the sealing season having now closed I could obtain no boat passage to Karabelni and was glad to be able to get away from Glinka to Preobrazhenskoye in a small boat on August 24. I was thus prevented from inspecting the Karabelni rookeries, a failure, however, of but little importance, on account of their comparative insignificance and the lateness of the season. On August 31 the *Yakut* called at Preobrazhenskoye, and the captain offering to convey me to Bering Island and from there to Petropaulski, I accepted gladly, that I might avail myself of the earliest opportunity of returning home, Mr. Barrett-Hamilton having already left the islands on August 19. I arrived in Petropaulski on September 4, but found no vessel going to America or Japan until October 20. The Russian Seal Skin Company's steamer *Kotik*, Capt. C. E. Lindquist, in the meantime making a trip to the seal islands for the purpose of bringing back the skins, I proceeded in her in order to inquire into the question of the mortality of the seal pups on North Rookery, Bering Island. I consequently left Petropaulski again on September 22 and arrived at the rookery in question the 27th. So unfavorable was the weather that the *Kotik* had to return to Petropaulski after nearly four weeks' absence without having accomplished the taking off of the skins. It was my original intention to return in that vessel to Japan, but as she was to make another attempt, which more than likely might take at least two weeks more, I obtained passage in the Japanese steamer *Taiyu Maru* from Petropaulski to Hakodate, Japan, leaving the former port on October 20 and arriving in the latter October 25, whence I proceeded by railroad to Tokyo and Yokohama. The first mail steamer brought me to San Francisco on November 27; on the 29th I conferred with Dr. Jordan at the Stanford University, and on December 5 I arrived in Washington, D. C.

ACKNOWLEDGMENTS.

In the first place, it gives me great pleasure to acknowledge the aid and courtesies received at the hands of Governor N. Grebnitski, the administrator of the islands, without which I should have been seriously embarrassed in my work. The following report would undoubtedly have been more replete with official data and statistics relating to the sealing industry on the islands had not the documents relating thereto been either sent away already or packed ready for shipment in anticipation of Mr. Grebnitski's prospective departure for St. Petersburg.

During the visits of 1896 and 1897 I received very material assistance from Mr. Nicolai S. Wachsmuth, the assistant administrator in charge of Copper Island, as well as most hospitable entertainment. It is likewise a pleasure to mention the reception and facilities accorded us in 1896 by Lieutenant Kolubakin, I. R. N., commanding the Russian naval guard stationed on Robben Island.

I am also under great obligations to the firm and officers of the Russian Seal Skin Company, the present lessees of the islands; to Mr. C. A. Williams, New London, Conn., and Mr. Thomas F. Morgan, Groton, Conn., formerly American members of the firm; to Mr. Constantine M. Grunwaldt, of St. Petersburg, the representative of the firm on the Pacific coast in 1896 and 1897; Mr. John Malovanski, of San Francisco, formerly the general agent of the company till 1895; Capt. C. E. Lindquist, of the *Kotik;* Capt. D. Grœnberg, of the *Bobrik;* Mr. E. Kluge, the resident agent on Bering Island; Mr. A. Kantor, on Copper Island, and Mr. P. H. Powers, the company's agent on board the steamship *Taiyu Maru*, in 1897.

It would be ungrateful not to mention the hospitality received from the Alaska Commercial Company and its functionaries, especially during my first visit to the islands. The liberality with which the members of this firm have been ever ready to assist scientific endeavors has contributed greatly to the success of my undertakings.

To Lieut. Commander F. J. Drake, U. S. N., commanding the United States Fish Commission steamer *Albatross*, during my trip in 1895, and his officers, and to the scientific staff of the vessel, and more particularly to Mr. C. H. Townsend, special thanks are due for courtesies during my stay on board, and to the latter for valuable information received during the preparation of this report, due credit for which is given in each instance.

It is with great pleasure that I acknowledge my obligations to the captain of H. M. S. *Porpoise*, Commander Francis R. Pelly, R. N., and his officers, for hospitalities and for aid in transportation during 1895.

Finally, I wish to express my appreciation of the assistance and courtesies received from the Treasury agent, Mr. J. B. Crowley, and by Mr. J. Stanley-Brown, the general agent of the North American Commercial Company, the present lessees of the Pribilof Islands, during my visits in 1895 and 1896.

During 1897 I received most valuable help, information, and transportation from many of the gentlemen above mentioned—Messrs. Grebnitski, Grunwaldt, Kluge, Kantor, Captains Lindquist and Grœnberg, the latter now commanding the barkentine *Bering*—as well as from the captains and officers of the U. S. revenue cutter *Grant*, Capt. Fred. M. Munger commanding; the imperial Russian cruiser *Koreets*, Captain Serebrennikof commanding, and the imperial Russian transport *Yakut*, Capt. I. V. Sukhotin commanding.

I can not close this chapter without special and cordial thanks to Lieut. Commander Jeff. F. Moser, commanding the *Albatross* during my cruise in 1896, as well as his officers and men. Having spent nearly six months with them, I learned to appreciate them highly, from the sailors up to the genial commander.

And last, but not least, thanks are due to the British fur-seal commissioner, Mr. G. E. H. Barrett-Hamilton, with whom I had the pleasure of studying the Bering Island rookeries in 1897. His hearty cooperation and cheerful companionship form a bright spot in the memories of five seasons spent in that out-of-the-way place.

II.—THE RUSSIAN SEAL ISLANDS.

Until the purchase of the Territory of Alaska by the United States, in 1867, all the resorts of the northern fur-seal north of California belonged to the Russian Empire, and the fur-seal industry of the North Pacific was entirely monopolized by the Russian-American Company.

These resorts were in all instances uninhabited islands, and at the time of their discovery by the Russian fur hunters, in the middle and latter part of the last century, even unknown to the native races. The seals, when first found on the rookeries about one hundred and fifty years ago, had never been interfered with by man while on their breeding grounds. The islands alluded to were the Commander group, certain small islands in the Okhotsk Sea, certain small islands in the Kuril chain, and the Pribilof group.

In 1867 the Pribilof Islands were sold to the United States, and in 1875 Russia ceded the Kurils to Japan in exchange for the southern half of the island of Sakhalin. There remain thus in the possession of the Russian Crown at the present date only the Commander Islands and the islands in the Okhotsk Sea.

I.—THE COMMANDER ISLANDS.

The Commander Islands (also occasionally called the Commodore Islands; Russian, *Komandorski Ostrova*), so named in memory of the great commander Bering, who discovered the group, comprise two main islands, Bering and Copper, situated off the east coast of Kamchatka, between 54° 33′ and 55° 22′ north latitude, and 165° 40′ and 168° 9′ east longitude, approximately 97 miles from Cape Kamchatka, the nearest point on the mainland. The southeast point of Copper Island is distant from Attu, the nearest American island, about 180 miles, and is less than 75 miles from the imaginary boundary line across Bering Sea between Russia and the United States. The distance between Bering Island and the port of Petropaulski is somewhat more than 280 miles, while a straight line between the nearest points of the Commander group and the Pribilof group is 750 miles. The steamer's track between the former and San Francisco is something like 3,100 miles.

Geographically the Commander Islands are the westernmost group of the Aleutian chain. Politically, however, they form a separate administrative district of the so-called Coast Province (*Primorskaya Oblast*). This enormous territory extends from Korea to the Arctic Ocean, and, including the peninsula of Kamchatka, is ruled by the governor-general of the Amur Province, residing at Khabarovka, on the Amur River, more than 1,200 miles, as the crow flies, from the Commander Islands. The administrative position of these islands, however, is somewhat complicated, inasmuch as they also depend directly under the minister of the Imperial Domain in St. Petersburg, 4,600 miles away. In other words, their position corresponds very much to that of our Pribilof Islands, which are subject both to the governor of Alaska and to the Secretary of the Treasury.

The Commander Islands were discovered on November 4, 1741 (old style). On that day the vessel *St. Peter*, with the commander Vitus Bering, and nearly the entire crew, sick to death with the scurvy, slowly approached the southern extremity of Copper Island from the east on their return voyage, after having discovered the mainland of America. Owing to the universal sickness, the ship's reckoning was entirely out, and the officers believed themselves off the coast of Kamchatka. The next day the vessel, over which the exhausted crew had hardly any control, drifted toward the east shore of Bering Island, and in the night following, a beautiful, still November night, of which this coast knows but few, the unfortunate craft came pretty near being left by the receding tide and wrecked on the projecting reefs at the southern entrance to the little bay called Komandor on the map (pl. 91). By an exceptional piece of good luck the breakers carried it safely over the rocks into the basin beyond, and a landing was effected.

To such extremity were the discoverers reduced, that it was decided to winter on this inhospitable shore. Hollows were dug in the ground for shelter and covered with skins of wild animals and sails. Many of the crew died of the scurvy, and on the 8th of December (old style) Bering himself. He was buried near the place marked on the map "Bering's grave." The others, 46 only out of 77, recovered slowly under the care of G. W. Steller, who accompanied the expedition as a naturalist. The vessel was thrown up on the beach during a heavy gale in the night between November 28 and 29 (old style), and all attempts to float it were in vain. The next spring, after a winter full of suffering and privations, the crew broke up the old vessel and of the materials built a smaller one, in which they landed at Petropaulski, Kamchatka, August 27, 1742.

The present writer visited the place of the shipwreck and the wintering August 30, 1882, and has given an account of it, with a ground plan of the hut and a sketch map of the locality, in Deutsche Geographische Blätter, 1885, pages 265–266. A partial rendering of this is found in Prof. Julius Olsen's translation of Lauridsen's "Vitus Bering" (Chicago, S. C. Griggs & Co., 1889), page 184, and additional notes, pages 214–215. The relics of the expedition found by me are deposited in the United States National Museum.

HYDROGRAPHIC NOTES.

It is astonishing how very little is definitely known about the hydrography of the western side of Bering Sea. But few vessels fitted for such work have visited that part of the world of late years, and those few have only made hurried passages through. In that way a small amount of material has been accumulated, which has been utilized by the Russian admiral S. O. Makarof, in his interesting work "Vitiaz i Tikhi Okean" (2 vols., St. Petersburg, 1894), in which, so far as the investigations relating to temperature and specific gravity of the waters of the western Bering Sea are concerned, his own observations on board the corvette *Vitiaz* form the most valuable part. This being the case, I have no hesitation in presenting, in a brief abstract, the substance of those paragraphs in his book which refer to the matter in hand, especially since a full understanding of the phenomena in question is a necessary basis for an equally full understanding of the distribution of the food animals of the seals and of the seals themselves.

On July 28, 1888, the *Vitiaz* left Petropaulski on a short trip to the Commander Islands. The bathymetric observations in Bering Sea have shown that the bed of warm water, of a temperature of + 9° C., is very thin near the coasts of Kamchatka.

At a depth of 10 meters a temperature of + 2.3° C. is found and at 25 meters only + 0.6°. Near the Commander Islands, with the same surface temperature of + 9° C., + 7.1°, was found at 25 meters and + 4.3° at 50 meters. We have here absolutely the same phenomenon as in the Japan Sea, viz, that the cold water predominates in the lower beds of the western portion of the sea. The identical phenomenon has been observed in the Okhotsk Sea and the Straits of Tartary.

The bathymetric observations in Bering Sea, at stations Nos. 108, 109, 110, and 113, have established another peculiarity of this sea, viz, the presence in the deeper portions of warm water of high salinity. Near the coast of Kamchatka the increase in temperature is shown as follows: At station No. 108, from 0° C. at 200 meters to + 3.5° C. at 400 meters; at station 109, from + 0.6° C. at 150 meters to + 2.6° C. at 175 meters and + 3.7° C. at 200 meters; at station 110, in longitude 165° 56′ E., at a depth of 100 meters a temperature of + 2° C. was found, and at 150 meters and below, + 3.9° C. The details are shown in the accompanying diagram (pl. 90).

These temperatures prove to us that the bed of warm water of great specific gravity is found nearer the surface at the Commander Islands than along the coast of Kamchatka. A similar phenomenon has also been observed in the Okhotsk Sea. In other words, the cold and less saline water in descending from north to south approaches the coast toward the western side of the sea and forces the warm water of high salinity to a greater depth.

Plate 90 shows a section of Bering Sea from the coasts of Kamchatka to the Commander Islands. The cold water here occupies an intermediate bed between the surface and a depth of 250 meters. As in the Okhotsk Sea, the bed thickens toward the mainland coast and tapers off as it recedes from it. It will also be seen that this cold water, with a temperature lower than 0° C., has a specific gravity of 1.0252 to 1.0251. Where does this water come from? Makarof concludes that as it can not come from the Pacific Ocean, which has no such temperature, it must descend from the surface. Since the surface water has a specific gravity of only about 1.0250, he suggests that the great salinity of this surface water is due to freezing in winter. As to the route this water follows, he believes that, as indicated by the temperatures observed by the *Tuscarora*, it advances from the southwest along the coast of Kamchatka and consequently also along the Kuril Islands.

The surface temperatures of the western portion of Bering Sea are indicated on plate 89, showing the existence of two cold zones, viz, one near Capes Tchaplin and Tchukotski, the other between Capes Navarin and St. Thaddeus. Everywhere else the cold water occupies the western part of Bering Sea and the warm water its eastern portion. In the other places the distribution of the temperature is pretty regular; it decreases gradually toward the north. The temperature near Petropaulski is 11° C., and near the island of St. Lawrence about 8° C., i. e., the mean temperature of August.

Fragmentary as is our knowledge of the waters themselves in the western portion of Bering Sea, the bottom of the sea over which they flow is hardly better known. In fact, until the U. S. Fish Commission steamer *Albatross* ran the four lines of deep-sea soundings in 1892, 1895, and 1896, the shape and nature of the bottom were even less known. The Russian and English men-of-war patroling the seas around the islands have of late years added a number of soundings at 100 fathoms and under, so that it has been possible on the appended map (pl. 87) to trace the 100-fathom line with some degree of accuracy, but not even Makarof in the *Vitiaz* seems to have been provided with an apparatus fit to take soundings deeper than 400 fathoms. The soundings which he made in the passage between Kamchatka and the Commander Islands, therefore, only proved it to be deeper than 400 fathoms, but how much we were unable to say. True, there were on the Russian Hydrographic Department chart No. 1454 (Vost. Okean, Bering. Mor.) two definite soundings, viz, 390 fathoms in 53° 41′ north latitude and 163° 29′ east longitude, but this being station No. 109 of the *Vitiaz*, and therefore in all probability taken from its records, we find upon turning to the latter that bottom was not found at 713 meters, or 390 fathoms. The other sounding on the same chart is 400 fathoms in 54° 45′ north latitude and 162° 50′ east longitude. By examining the records of the *Vitiaz* we find no soundings taken by that vessel in that latitude, but we find on the other hand that station No. 113 was in 53° 45′ north latitude and 162° 50′ east longitude, and that a sounding was there taken with the result that bottom was not touched in 732 meters or 400 fathoms. The above figures are too close not to make it almost absolutely certain that by a clerical error the sounding in question was plotted a whole degree too far north and the dash with the dot over left out.

In the chart of the western portion of Bering Sea, which I had prepared for the first edition of this work (pl. I), the 100-fathom curve around the Commander Islands was drawn for the first time with some pretensions at accuracy. Up to that time it had been asserted in some publications that the Commander Islands "belong to the Kamchatka system, Copper Island resting just within the 100 fathom curve from the Asiatic coast." The soundings of the *Vitiaz* had, however, already demonstrated that the sea between the mainland and the islands was deeper than 400 fathoms, and on the map in question the islands were therefore connected with the peninsula of Kamchatka by the 500-fathom curve. I was careful, however, to state that "even that is only conjectural."

How well taken this reservation was is best shown by the fact that where I had "conjectured" a depth of 500 fathoms, we found an abyss more than 3,000 fathoms deep. Captain Moser was kind enough to accede to my request for a line of soundings between the north end of Bering Island and the mainland of Kamchatka, during our run between Ari Kamen, Bering Island, and Cape Koslof, Kamchatka, August 9–10, 1896. Eight soundings were taken, as follows: 41, 2,250, 2,665, 3,117, 2,078, 473, 586, and 453 fathoms, as shown on the accompanying map (pl. 87). It will be seen that the drop from the 100-fathom plateau of the islands is as sudden and violent on this side as on the eastern side, necessitating a corresponding alteration of the curves surrounding them.

While this line of soundings has thus furnished a series of fundamental and highly interesting facts, it has also given rise to a number of tantalizing problems and questions. Does the sounding of over 3,000 fathoms between Bering Island and Kamchatka simply indicate a deep hole, or is it connected with the *Tuscarora* soundings to the south? In the latter case, does an average depth of 3,000 fathoms, or over, extend up to the islands, with one comparatively narrow ridge represented by the *Tuscarora* soundings between 2,980 and 1,777 fathoms between latitudes 51° and 52°? Or does only a comparatively narrow channel of 3,000 fathoms and more extend to the northeastward parallel with the coast of Kamchatka? And again, is this deep basin between Bering Island and Cape Koslof continued to the northward, connecting with the 2,000-fathom basin to the northeast of the Commander Islands, or are these islands situated on a more or less elevated ridge extending from Cape Kamchatka to Attu?

The latter alternative seems for the present the more probable, though the depth of the ridge between Cape Kamchatka and Northwest Cape of Bering Island can of necessity only be vaguely guessed at. I have also selected the alternative of the 3,000-fathom channel parallel with the Kamchatkan coast and introduced these features in the map (pl. 87), but I wish to reiterate what I said with regard to the first edition of it, viz, that—

The curves of the various depths from 100 fathoms down to 2,000 fathoms and over are, as a matter of necessity, highly conjectural. In the northeastern section of the map they appear even somewhat problematical, in view of the fact that a series of shallow soundings, running southwest from Cape Olintorski on the charts of the United States Hydrographic Office, have been left out of consideration altogether. The reason is, that the series is crossed by the deep soundings of the *Albatross* on her return passage from the Commander Islands in 1895 in such a manner that it is impossible to reconcile them. They may possibly belong farther west[1]—a not unreasonable supposition, since the determination of the longitude of the various coasts and promontories in that part of the world is in such utter confusion[2] that a resurvey of the whole coast from Petropaulski to Providence or Plover Bay is imperatively demanded.[3]

In all this uncertainty only a few points can be regarded as fairly well established, viz:

(1) The Commander Islands are situated upon a small and narrow plateau, which may possibly be connected with the Kamchatka mainland to the northwest by a ridge of greater or less elevation.

(2) This plateau rises very abruptly from an ocean floor between 2,000 to 3,000 fathoms, so that the islands themselves on nearly all sides rise almost perpendicularly out of this depth.

(3) Between the Commander Islands and Attu, the nearest of the American Aleutian Islands, there is a gap certainly more than 1,900 fathoms deep. Whether the *Albatross* maximum sounding of 1,996 fathoms, only a short distance from the south end of Copper Island, is really the maximum depth, thus indicating a slightly elevated ridge between the floor of the Bering Sea and the so-called *Tuscarora* deep, or whether there may not be a channel of 2,100 fathoms, or thereabouts, on one side of the sounding in question, remains to be seen.

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[1] I find on Berghaus's "Chart of the World on Mercator's Projection" a sounding of 2,700 fathoms indicated in (approx.) latitude 56° 40′ north and longitude 168° 20′ east, the authority for which I am ignorant of. It is situated almost in a line between the 1895 *Albatross* soundings of 2,137 and 1,866 fathoms, and if correct would indicate a depression below the general level of about 2,100 fathoms in that part of Bering Sea.

[2] Witness the fact that the various charts of the region for more than ten years have borne the following inscription: "The coast of Kamchatka north of Cape Koslof is reported to be charted 15 miles too far east." Yet nothing has been done to clear up the doubt.

[3] This conjecture has in a measure been confirmed by a statement of Capt. R. N. Crowell, master of the British sealing schooner *Brenda* (Venning's Report, 1893, p. 90), to the effect that the only "bank" he knew of in the vicinity of the Commander Islands is north of Bering Island, off Cape Olintorski, the "center of the 'bank' being in about latitude 58° north, longitude 170° east. Soundings can be had from 40 fathoms up."

(4) The bottom of Bering Sea to the east of the Commander Islands forms a nearly level floor of an almost uniform depth of 2,100 fathoms, sending off an arm or bay of equal depth to the north of the islands toward the neck of the Kamchatkan peninsula. The walls of this basin are excessively steep at the islands, but are believed to slope off gradually toward the curve of the coast between Capes Oserni and Oliutorski.

To complete the account, I append the records of the soundings taken by the *Albatross* and the *Vitiaz* in the waters covered by the map (pl. 87).

Records of recent soundings in the western portion of Bering Sea.

Hydro. station.	Date.	Time.	N. lat.			E. long.			Depth.	Bottom.	Vessel.
			°	′	″	°	′	″	*Faths.*		
	1888.										
107	July 29	4 p. m	52	58	0	160	02	0	49		Vitiaz.
108	...do	6.40 p. m	53	02	0	160	16	0	438		Do.
109	July 30	9 a. m	53	41	0	163	29	0	390		Do.
110	...do	8.15 p. m	54	15	0	165	56	0	300		Do.
111	July 31	8.37 p. m	54	39	0	166	35	0	55		Do.
112	Aug. 1	2.30 p. m	55	02	0	165	15	0	109		Do.
113	Aug. 2	4.30 a. m	53	45	0	162	50	0	400		Do.
	...do	4 p. m	52	55	0	160	14	0	175		Do.
	1892.										
3231	May 29	10.40 p. m	53	13	0	172	38	0	1,447	yl. M. fne. S	Albatross.
3232	May 30	5.48 a. m	53	38	0	171	28	0	1,818		Do.
3233	...do	11.35 a. m	54	02	0	170	17	0	1,853	fne. bk. S	Do.
3234	...do	6.12 p. m	54	19	0	169	03	0	1,996	yl. M. S	Do.
3235	May 31	12.03 a. m	54	30	0	168	07	0	47	fne gy. S	Do.
3236	...do	1.34 p. m	55	09	0	165	51	0	25	rky	Do.
3237	...do	3.10 p. m	55	10	0	165	47	0	33	rky. M	Do.
3238	...do	4.33 p. m	55	08	0	165	48	0	36	gy. S	Do.
3239	...do	5.34 p. m	55	10	30	165	45	0	32	.....do	Do.
	1895.										
3546	June 30	3.04 p. m	55	59	0	178	43	0	2,105	br. M. oz	Do.
3547	...do	10.25 p. m	55	55	0	177	12	0	2,113	.....do	Do.
3548	July 1	7.05 a. m	55	52	0	175	25	0	2,120	.....do	Do.
3549	...do	4.35 p. m	55	53	0	173	53	0	2,111	.....do	Do.
3550	July 2	2.37 a. m	55	59	0	171	57	0	2,086	.....do	Do.
3551	...do	10.20 a. m	56	00	0	169	46	0	2,154	.....do	Do.
3552	...do	4.58 p. m	56	00	0	168	16	0	2,153	.....do	Do.
3553	...do	11.07 p. m	55	58	0	166	43	0	2,119	gy. S. M	Do.
3554	July 3	2.21 a. m	55	43	0	166	15	0	2,090	.....do	Do.
3555	...do	5.14 a. m	55	25	0	165	46	0	70	.....do	Do.
3556	...do	6.34 a. m	55	16	0	165	32	30	20	crs. S. rky	Do.
3557	...do	7.10 a. m	55	12	0	165	38	0	35	gy. S	Do.
3558	...do	7.31 a. m	55	11	0	165	40	0	37	.....do	Do.
3559	...do	8.04 a. m	55	11	20	165	46	20	15	rky	Do.
3560	July 5	12.22 p. m	55	25	30	165	48	0	144	fne. gy. S	Do.
3561	...do	12.49 p. m	55	27	0	165	49	0	66	rky	Do.
3562	...do	1.17 p. m	55	28	30	165	51	30	341	gy. S. M	Do.
3563	...do	2.20 p m	55	32	0	165	56	30	1,087	S	Do.
3564	July 6	1.17 a. m	56	25	0	167	52	0	2,137	gr. oz	Do.
3565	...do	7.15 a. m	56	56	0	169	06	0	1,866	bl. M. oz	Do.
3566	...do	12.01 p. m	57	16	0	169	41	0	972	.....do	Do.
3567	...do	2.29 p. m	57	29	0	170	09	0	410	gy. S. M	Do.
3568	...do	4.15 p. m	57	35	0	170	24	0	537	br. oz. G	Do.
3569	...do	6 p. m	57	41	0	170	39	0	609	br. oz. S	Do.
3570	...do	7.22 p. m	57	47	0	170	54	0	540	gn. oz. G	Do.
3571	...do	8.44 p. m	57	53	0	171	09	0	696	gn. M. oz	Do.
3572	July 7	12.37 a. m	58	13	0	171	51	0	1,469	.....do	Do.
3573	...do	5.05 a. m	58	36	0	172	47	0	1,898	hard	Do.
3574	...do	10.55 a. m	58	23	0	174	17	0	1,978	bl. M. oz	Do.
3575	...do	5.04 p. m	58	12	0	175	49	0	2,041	br. M. oz	Do.
3576	...do	11.07 p. m	58	01	0	177	21	0	2,068	.....do	Do.
	1896.										
3660	Aug. 9	3.05 p. m	55	11	30	165	39	0	41	fne. gy. S. bk. Sh	Do.
3661	...do	5.21 p. m	55	08	30	165	26	0	2,250	fne. gy. S. bk. P. C	Do.
3662	...do	11.16 p. m	54	49	42	164	36	0	2,665	M. fne. dk. S. P	Do.
3663	Aug. 10	5.24 a. m	54	51	0	163	46	0	3,117	bn. M. fne. dk. S	Do.
3664	...do	11.01 a. m	54	42	30	162	55	0	2,077	bn. M. dk. S. P	Do.
3665	...do	4.20 p. m	54	35	0	162	11	30	473	bn. M. dk. S. P	Do.
3666	...do	5.49 p. m	54	32	30	161	58	30	586	bn. M. fne. S. P	Do.
3667	...do	7.07 p. m	54	29	0	161	50	0	453	bn. M. dk. S. P	Do.

METEOROLOGY.

The climate of the Commander Islands, in spite of their vicinity to Kamchatka, is not particularly severe, but the excessive moisture and the low summer temperature make it rather disagreeable, though by no means unhealthy. The chief interest centers in the temperature, the moisture, precipitation, and cloudiness for the months of May to November inclusive, during which time the fur seals stay on the islands. But as the meteorological observations made on the islands have never been published in full or collectively, I have appended a set of tables of the monthly means for the four years during which the United States Signal Service maintained a station at Nikolski, Bering Island.

One of the objects of my trip to the Commander Islands in 1882 was to establish meteorological stations there and in Petropaulski. The village at Copper Island was found unsuitable for the purpose and no regular observations were taken there. At Nikolski, however, I established and maintained during my entire stay a three-daily station, beginning May 22, 1882. During my sojourn there I trained the late Mr. George Chernick, agent of Hutchinson, Kohl, Philippeus & Co., in the use of the instruments, so that whenever I was absent from the station exploring, collecting, or investigating the rookeries, he took the observations. At my departure he was appointed a United States Signal Service observer, whose duties he conscientiously fulfilled until his resignation in April, 1886, at which time the station was abandoned.

The observations were taken simultaneously with those in Washington, D. C., viz, at 7 a. m., 3 p. m., and 11 p. m., Washington time, or, respectively, 11.12 p. m., 7.12 a. m., and 3.12 p. m., local time.

The instruments used were as follows:

A mercurial barometer, United States Signal Service, No. 1837.
An exposed thermometer, No. 939.
A minimum thermometer, No. 648.
A maximum thermometer, after June, 1883.
A wet-bulb thermometer, for determining the relative humidity, after June, 1883.
A Robertson's anemometer.
A wind vane, belonging on the island.
A Signal Service standard rain gauge.

The barometer cistern was 20 feet above sea level.

The thermometers were hung in a large lattice box on the north side of my house, the box covering the window; and the instruments were read through the latter from the inside.

The rain gauge[1] had to be located very high (9 feet) and in an exposed place to keep it from the marauding sledge dogs. This instrument was not satisfactory in a high wind. The wind in blowing across the mouth of the funnel would actually suck the air out of the latter, thus preventing the rain or snow from entering. Many a time after a considerable rain I have found the rain gauge dry inside. The actual amount of precipitation is therefore greater than shown in the table given below, though the figures in the latter may serve for comparison with those from similar localities in the United States, particularly on the Pribilof Islands and in Alaska, where the same kind of rain gauge was in use.

The following tables I have transcribed directly from the original records. The monthly means are those of the means of the three daily observations. The method of observing, correcting, and tabulating is that in vogue in the Signal Service, and the figures are strictly comparable with those of the other stations of the same service.

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[1] Report Chief Sig. Off. 1887, II, p. 382, pl. XXXVI, fig. 97.

Monthly means of Meteorologic Observations made by Leonhard Stejneger and George Chernick at Nikolski, Bering Island, from May, 1882, to April, 1886, inclusive.

MEAN MONTHLY BAROMETER.

[Corrected for temperature and instrumental error only. Elevation of barometer, 20 feet above sea level. Centr. gravity + 0.030.]

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1882....	....	....	....	....	*a*29.805	29.738	29.720	29.827	29.842	29.807	29.660	29.524
1883....	29.392	30.053	29.784	29.846	29.783	29.752	29.837	29.816	29.775	29.603	29.817	29.512
1884....	29.565	29.540	29.579	29.744	29.811	29.938	29.721	29.785	29.947	29.747	29.355	29.560
1885....	29.397	29.844	29.905	29.730	29.705	29.693	29.640	29.766	29.882	29.965	29.750	29.612
1886....	29.517	29.794	29.781	29.600	....	....	....	....	....	....	....	....

a Means of 10 observations.

MEAN TEMPERATURE.

[The mean temperature was obtained by adding together the observations made at 7.12 a. m., 3.12 p. m., and 11.12 p. m., local time, and dividing by 3.]

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F
1882....	....	....	....	....	*a*39.7	42.7	48.2	54.1	50.5	38.8	28.7	27.0
1883....	25.5	28.7	25.2	28.6	35.3	41.7	45.0	51.9	45.2	37.0	31.4	28.8
1884....	25.9	28.9	28.3	30.7	36.6	42.2	48.1	49.5	45.9	37.4	31.1	26.4
1885....	26.9	25.7	27.4	27.7	35.1	41.9	46.2	48.3	45.6	34.8	29.9	26.9
1885....	27.4	27.0	27.2	30.7	....	....	....	....	....	....	....	....
Means.	26.4	27.6	27.0	29.4	35.7	42.1	47.1	51.0	46.8	37.2	30.3	27.3

Annual means: 1883, 35.5; 1884, 35.9; 1885, 34.7.
a Mean of 10 observations, May 22 to 31, not included in the means.

MAXIMUM TEMPERATURE.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.
1882....	....	....	....	....	....	....	....	....	....	*a*48.0	*a*40.3	*a*39.1
1883....	*a*33.0	*a*38.0	*a*33.9	*a*38.0	*a*56.0	59.5	57.5	63.0	57.0	49.1	42.9	40.7
1884....	36.6	36.8	38.9	39.5	45.4	53.5	62.7	55.7	56.0	49.9	38.2	37.0
1885....	36.1	43.4	36.0	39.8	48.5	56.6	62.9	57.1	53.6	51.0	44.0	38.0
1886....	37.0	38.0	37.0	39.0	....	....	....	....	....	....	....	....

Highest: 1883, Aug. 23, 63.0; 1884, July 19, 62.7; 1885, July 24, 62.9.
a Highest exposed.

MEAN MAXIMUM TEMPERATURE.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.
1882....	....	....	....	....	....	....	....	....	....	....	....	....
1883....	....	....	....	....	....	*a*46.1	51.0	56.9	49.6	43.1	35.8	33.1
1884....	29.8	32.4	32.6	35.3	41.5	47.3	52.8	53.5	51.0	41.6	34.8	30.3
1885....	30.8	30.7	30.7	31.5	39.1	46.8	51.6	52.4	49.4	39.2	34.4	30.5
1896....	30 7	30.2	31.3	35.1	....	....	....	....	....	....	....	....

a Mean of 28 observations.

Monthly means of Meteorologic Observations at Bering Island—Continued.

NUMBER OF DAYS OF MAXIMUM THERMOMETER BELOW 32°.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1882	......	......	......	......	......	......	......	......	......	......	......	......
1883	......	......	......	......	......	0	0	0	0	0	8	12
1884	17	11	14	4	0	0	0	0	0	0	4	17
1885	17	15	18	16	1	0	0	0	0	0	10	20
1886	17	17	13	5	......	......	......	......	......	......	......	......
Means.	17.0	14.3	15.0	8.3	0.5	0	0	0	0	0	7.3	16.3

Total: 1884, 67 days; 1885, 97 days.

MINIMUM TEMPERATURE.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.
1882	......	......	......	......	......	31.3	39.4	44.6	35.3	17.6	9.8	−1.4
1883	3.3	10.8	11.2	5.3	25.8	33.4	34.6	39.5	31.3	24.5	15.5	9.8
1884	6.3	9.5	12.2	0.6	27.4	31.5	37.3	38.2	30.4	22.4	13.4	6.2
1885	3.4	3.0	0.9	4.5	22.5	31.2	36.2	37.2	34.2	17.9	6.9	12.4
1886	5.0	15.0	13.0	13.0	......	......	......	......	......	......	......	......

Lowest: 1882, −1.4 Dec. 21; 1883, 3.3 Jan. 6; 1884, 0.6 Apr. 1; 1885, 0.9 Mar. 17.

MEAN MINIMUM TEMPERATURE.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.
1882	......	......	......	......	......	38.6	45.0	50.7	44.5	33.7	23.5	21.7
1883	20.9	24.6	21.1	24.0	*a* 29.4	37.6	36.1	48.3	41.3	33.0	27.8	22.8
1884	21.2	24.0	24.1	26.2	32.5	38.0	43.8	46.0	40.2	32.6	26.5	20.9
1885	21.7	20.1	23.1	21.9	32.0	38.2	42.9	44.9	42.1	29.6	24.4	22.2
1886	23.8	24.6	23.8	27.9	......	......	......	......	......	......	......	......

a Mean of 29 observations.

NUMBER OF DAYS OF MINIMUM THERMOMETER BELOW 32°.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1882	......	......	......	......	......	1	0	0	0	11	26	28
1883	31	26	30	27	11	0	0	0	1	15	23	30
1884	31	26	31	26	13	1	0	0	1	10	24	31
1885	30	26	30	26	11	1	0	0	0	21	25	29
1886	30	25	29	27	......	......	......	......	......	......	......	......
Means.	30.5	25.8	30.0	26.5	11.7	0.8	0	0	0.5	14.2	24.5	29.5

Total: 1883, 194 days; 1884, 194 days; 1885, 199 days.

NUMBER OF CLEAR DAYS.

[A "clear" day has no clouds, or less than 0.3 clouds.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1882	......	......	......	......	......	0	0	3	4	0	1	0
1883	0	5	0	0	0	0	0	0	3	0	0	0
1884	0	0	0	0	0	0	1	0	3	0	1	0
1885	0	0	0	0	0	4	2	3	0	0	0	0
1886	0	0	0	0	......	......	......	......	......	......	......	......
Means.	0	1.2	0	0	0	1	0.8	1.5	2.5	0	0.5	0

Total number of clear days: 8 in 1883; 5 in 1884; 9 in 1885; annual mean, 7.

Monthly means of Meteorologic Observations at Bering Island—Continued.

NUMBER OF FAIR DAYS.

[A "fair" day has from 0.3 to 0.7 clouds.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1882....	....	....	....	....	....	....	5	5	19	11	17	12
1883....	8	6	8	7	4	4	7	10	12	13	5	14
1884....	2	5	6	8	4	6	5	1	16	12	8	10
1885....	4	4	4	6	16	7	18	11	6	13	12	9
1886....	8	5	7	7	....	....	....	....	....	....	....	....
Means.	5.5	5.0	6.2	7.0	8.0	5.7	8.8	6.8	13.2	12.2	10.5	11.2

Total number of fair days: 98 in 1883; 83 in 1884; 110 in 1885; annual mean, 97.

NUMBER OF CLOUDY DAYS.

[A "cloudy" day has from 0.8 to 1.0 clouds.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1882....	....	....	....	....	....	....	26	23	7	20	12	19
1883....	23	17	23	23	27	26	24	21	15	18	25	17
1884....	29	24	25	22	27	24	25	30	11	19	21	21
1885....	27	24	27	24	15	19	11	17	24	18	18	22
1886....	23	23	24	23	....	....	....	....	....	....	....	....
Means.	25.5	22.0	24.8	23.0	23.0	23.0	21.5	22.8	14.2	18.8	19.0	19.8

Total number of cloudy days: 259 in 1883; 278 in 1884; 246 in 1885; annual mean, 261.

NUMBER OF FOGGY DAYS.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1882....	....	....	....	....	....	....	9	10	0	0	0	0
1883....	0	0	0	0	2	3	9	10	2	0	1	0
1884....	0	0	0	0	0	0	2	0	0	0	0	0
1885....	0	0	0	0	0	1	2	1	0	0	0	0
1886....	0	0	0	0	....	....	....	....	....	....	....	....
Means.	0	0	0	0	0.7	1.3	5.5	5.2	0.7	0	0.2	0

CLOUDINESS, EXPRESSED IN PERCENTAGES.

[The percentage of cloudiness was obtained from the eye estimates of the observer, recorded on a scale of 0 to 10 at each observation. The mean of the three daily observations was used as the mean for the day; 100 per cent represents sky completely overcast.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1882....	....	....	....	....	....	....	93	83	60	79	73	78
1883....	86	72	86	84	90	92	89	85	73	74	77	78
1884....	91	89	88	79	87	81	66	87	65	79	83	81
1885....	88	86	90	86	75	75	63	73	86	76	77	80
1886....	84	86	86	81	....	....	....	....	....	....	....	....

Annual means: 82 in 1883, 81 in 1884, 80 in 1885.

Monthly means of Meteorologic Observations at Bering Island—Continued.

PERCENTAGE OF RELATIVE HUMIDITY.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1882....	......	......	......	......	......	......	......	......	......	......	......	......
1883....	......	......	......	......	......	89.9	91.1	93.5	87.9	84.0	85.2	82.6
1884....	83.3	84.3	87.4	90.1	88.5	35.1	92.2	91.8	82.4	86.3	90.8	90.2
1885....	89.9	93.2	89.3	89.0	89.4	90.3	92.7	92.3	91.5	84.7	90.2	87.0
1886....	95.1	92.1	90.0	90.3	......	......	......	......	......	......	......	......
Means.	89.4	89.9	88.9	89.8	89.0	88.4	92.0	92.5	87.3	85.0	88.7	86.6

Annual means: 87.7 for 1884, 90 for 1885.

RAINFALL AND MELTED SNOW—AMOUNT OF PRECIPITATION.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
	Inches.	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
1882....	......	......	......	......	......	2.07	1.45	1.07	1.32	3.29	2.23	2.21
1883....	0.61	2.98	0.61	1.03	0.38	2.38	1.77	2.25	2.50	2.90	2.20	1.96
1884....	0.94	1.49	1.44	1.38	1.31	0.26	2.27	1.71	1.70	3.26	3.39	0.96
1885....	0.58	0.39	0.25	0.86	1.19	1.63	4.05	2.15	3.32	1.34	4.08	1.61
1886....	0.66	1.50	1.33	1.25	......	......	......	......	......	......	......	......

Total: 21.57 inches in 1883; 20.11 inches in 1884; 21.45 inches in 1885.

NUMBER OF DAYS ON WHICH 0.1 INCH OR MORE RAIN OR SNOW FELL.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1882....	......	......	......	......	......	13	18	16	5	12	7	8
1883....	20	19	14	18	10	20	20	19	16	16	18	19
1884....	12	14	15	12	11	5	13	15	14	20	13	16
1885....	18	8	10	7	12	12	12	14	14	12	18	8
1886....	13	12	11	9	......	......	......	......	......	......	......	......

Total: 209 days in 1883; 160 days in 1884; 145 days in 1885.

PREVAILING WINDS.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1882....	......	......	......	......	......	S.	S.	S.	S. & SW.	N.	NW.	S.
1883....	NE.	S.	E.	E.	N.	S.	S.	S.	S.	SW. & NW.	SW.	E.
1884....	NE.	NE.	N.	N.	S.	S.	S.	E.	SW.	N.	NE.	E.
1885....	E.	NE.	NE.	N.	N.	S.	S.	S.	S.	NW.	N.	NE.
1886....	NE.	E.	N.	SW.	......	......	......	......	......	......	......	......

MAXIMUM HOURLY VELOCITY (IN MILES).

[Taken from current velocities.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1882....	......	......	......	......	......	......	20	......	37	42	45	54
1883....	54	41	39	36	34	36	20	47	30	43	44	42
1884....	40	48	40	43	26	18	22	40	30	46	37	34
1885....	33	43	35	35	38	32	27	......	25	48	37	48
1886....	37	26	41	42	......	......	......	......	......	......	......	......

A considerable amount of *snow* falls during the winter. The fierce winter gales usually blow it off the plateaus, forming immense drifts in the valleys and on the lee side of the mountains. In deep shadowy gullies it often remains all summer, and in cold seasons, as for instance 1895, large drifts still remain unmelted as late as September, even at the level of the sea.

Drift ice seems to be of rare occurrence in recent times. I do not know how much reliance can be placed in old Pitr Burdukovski's story to me that formerly, say about 1850, "drift ice was yearly observed coming from the north in large masses." Certain it is that Steller expressly states that during the winter no ice collected in the sea. (Ber. Ins., p. 270.)

To complete the meteorologic account I may mention that *thunderstorms* are of rare occurrence on the Commander Islands. In 1879, on November 19, Mr. Krebs, after a residence of eight years in the main village on Copper Island, experienced the first thunderstorm. In 1881, on February 8, he records "a stroke of lightning and a short, but strong thunderclap about 7 p. m." Mr. Chernick, in Nikolski, Bering Island, reports "thunder and lightning" on September 12, 1878. I myself observed a thunderstorm passing over Nikolski, September 18, 1882. The first lightning was observed at $9^h\,58^m$ p. m., local time; wind SW., 13 miles an hour; barometer, 29.552 inches; temperature of air, 52.2° F.; clouds, cumulo-stratus, 8, direction SW.; intervals between first lightning and thunder, 96 seconds; sixth thunderclap ($10^h\,25^m$ p. m.), 12 seconds after lightning; tenth, 40 seconds; eleventh lightning before thunder of tenth. This was the last distinct thunder heard, $10^h\,35^m$ p. m. After that continued distant lightning lit up a narrow strip along the northern horizon. No lightning seen after $11^h\,10^m$ p. m.

Aurora borealis is equally scarce. At Nikolski, on November 15, 1882, I observed a faint northern light at $12^h\,30^m$ a. m., local time, extending to about η *Urs. majoris.* On November 17, 1882, I observed another at $10^h\,40^m$ p. m., local time, consisting of a uniform greenish white light below, above which most of the time a large rosy space was seen filling the arch between γ and η *Urs. majoris;* a similarly colored but often broken arch extended through the constellations of *Cygnus*, *Cassiopeia*, *Gemini*, and *Auriga*, sometimes fainter, sometimes more fiery, especially in *Cygnus.* Very seldom the red color filled the space between the rosy spot below *Ursa major* and the upper arch, and then only for a few seconds. At 11 p. m. the sky became so overcast as to cut off further observation.

Corresponding observations made at St. Paul Island, Pribilof group, from 1872 to 1883, and published by the United States Weather Bureau (Fur Seal Arb., II, App. pp. 591–593), afford means of exact comparison between the Russian and the American seal islands, except as regards mean temperature, the latter being obtained on St. Paul from observations made at 7 a. m., 2 p. m., and 9 p. m.

But even a comparison of the *mean temperature* affords several very interesting results. Thus, while the annual means apparently differ but slightly, there is also the same relative proportion between the various months from December to September. But while the figures representing the mean temperatures for these months are higher on Bering Island than on St. Paul, those of October and November are higher on the latter. The chief exception from the relative proportion between the months is shown by the mean temperatures of August, which is about 4 degrees higher than July and September in Bering Island, but only about 2 degrees in St. Paul.

Turning now to the *maximum temperature*, it will be seen to be 63° F. in Bering Island as against 62° on St. Paul. But on the other hand, while the *minimum* *temperature* in Bering Island was hardly ever below zero during the four years of observation, it often drops below that point in St. Paul. Thus, the difference between the summer and winter extremes is less on Bering Island than on St. Paul.

Coming now to the question of *cloudiness*, it will be seen that while the annual percentage is almost identical, the monthly distribution is radically different. Thus, while in St. Paul Island there are five times as many clear days during November to April as during May to October, on Bering Island the proportion is reversed, there being four times as many clear days during the latter period as during the former. Of fair days St. Paul enjoys nearly twice as many during the above six winter months as during the six summer months, while Bering Island has a good many more fair days in summer than in winter. Consequently, the entirely overcast days preponderate on St. Paul in summer, while on Bering Island their number is greater in winter. The latter island, moreover, has about 10 per cent more overcast days during the whole year, but on the contrary also about 10 per cent less overcast during the summer months, or during the time the seals remain on the islands.

Unfortunately the percentage of *relative humidity* is not given for St. Paul Island. A glance at the table for Bering Island will show how excessively humid the climate of the latter is, the annual means reaching 90 per cent, the monthly means occasionally exceeding 95 per cent, and never lower than 82 per cent. The months showing the greatest percentage of relative humidity are July and August.

The Weather Bureau tables alluded to do not contain any data relating to *precipitation* on St. Paul Island, and all the published information I have been able to find relates only to the months May to November.[1] Compared with the corresponding tables for Bering Island, they show that the precipitation on the latter island is considerably smaller during that period than on St. Paul Island.

FAUNA AND FLORA OF THE COMMANDER ISLANDS.

The animals and plants of the Commander Islands have been studied since Steller set foot on the virgin ground of Bering Island in 1741. He collected and described all the new things he saw, and if he had lived to elaborate his collections and finish his work but little would have been left for his successors. Since then Vosnessenski has been on the island; Dr. Dybowski collected during various visits between 1879 and 1883; Nordenskiœld's *Vega* expedition, with his admirable staff of scientists, Nordquist, Kjellman, Stuxberg, and Almquist, used their five days' stay in 1879 exceedingly well; and, above all, Mr. Grebnitski has devoted work, time, and money during nearly twenty years to enrich the Russian museums, particularly that of the Imperial Academy of Sciences in St. Petersburg, with extensive and costly collections of natural history. The United States National Museum is also indebted to him for valuable material. Finally, during my stay in 1882–83, and to a less extent in 1895 and 1897, I myself have been able to add my mite to our knowledge of the flora and fauna of these islands, nearly all my collections being now in the United States National Museum. Yet the subject is not exhausted; many animals and plants occurring there remain uncollected, while many of the collections in the museums await the arrival of the specialist to work them up.

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[1] Fur Seal Arb., VIII, pp. 518–519.

Lack of time and space prevents more than the briefest possible résumé of the subject in the present connection; a more exhaustive treatise would make a book in itself. There is abundant evidence in the material at hand to show that the islands during the period previous to which they received their present fauna and flora were totally covered by the sea, and that since that time they have not been connected with the mainland on either side. From this it follows that the animals and plants are not truly indigenous, though I have no doubt that many of the numerous species described as new from these islands are really peculiar and not found elsewhere; but in that case their origin on the islands is undoubtedly due to comparatively recent isolation. The sporadic character of the fauna and flora as shown in the great number of genera in proportion to the species, as well as the absence of many forms which, from their general distribution, would be expected to occur, is clearly indicative of the accidental immigration of the component species. They evidently immigrated, especially and more regularly from the west, from Asia, by means of prevailing winds—currents and driftwood carried by these—and more seldom from the east, from America. That such inhabitants as are more independent of the above agencies likewise show nearer relationship to the Asiatic fauna is partly due to the shorter distance and partly to the well-known effort of the Asiatic fauna to extend beyond its own limits.

As might be expected from their location, the islands are chiefly palæarctic in their bio-geographical relations, with a fair sprinkling of circumpolar, American, and North Pacific forms. The marine fauna and flora partake more particularly of this latter character, and it is probable that Dr. W. H. Dall's conclusions, derived from a study of the mollusks, applies to most of the other marine animals, viz:

> The fauna of Commander Islands, as far as known, is intimately related to the general Arctic fauna and especially to the Aleutian fauna, somewhat less so to the Kamchatka fauna, but presents in itself nothing distinctive. While the faunal aspect of the mollusca is boreal, there is a number greater than might be expected of species common to Japan and California.

To this statement he afterwards added the note:

> The connection with Japan is rather that the northern forms extend southward into Japan than that any characteristic Japanese forms extend north. (Proc. U. S. Nat. Mus., IX, 1886, p. 219.)

MAMMALS.

The chief zoological interest centers in the four marine mammals revealed to the scientific world in Steller's famous treatise "De Bestiis Marinis" (Novi Comm. Ac. Sc. Imp. Petrop., II, 1751, pp. 289–398, pls. XIV–XVI), which must always remain a monument to the learning and industry of its author. In this he described for the first time the sea cow, the sea lion, the fur-seal, and the sea otter.

Of these, the sea cow (*Hydrodamalis gigas*, also known as *Rytina gigas* or *stelleri*) possesses greatest interest, on account of its early extermination by man, which took place in 1768, twenty-seven years after its discovery. The sea cow was an herbivorous animal, anteriorly shaped somewhat like a seal, but with a large caudal fin like that of a whale or fish, but no hind legs, and belonging to the mammalian order of *Sirenia*, the few living relations of which, the manatee and dugong, now only inhabit the tropical waters of both hemispheres. There is no indisputable evidence of its having ever inhabited other coasts than those of the Commander Islands, as the find of a rib on Attu Island does not necessarily prove that the animal once lived there, though that is not improbable. The history of this animal, imperfectly known as it is, fills volumes, and all we can do in the present connection is to refer to some of the more recent literature (Büchner, Die Abbildungen der nordischen Seekuh, Mém. Ac. Imp. Sc. St. Petersb., 7 ser., XXXVIII, 1891, No. 7.—Stejneger, Proc. U. S. Nat. Mus., 1883, pp. 78-86; 1884, pp. 181-189.—Stejneger, On the Extermination of the Great Northern Sea Cow, Am. Geogr. Soc. Bull., No. 4, 1886, pp. 317-328.—Stejneger, How the Great Northern Sea Cow (*Rytina*) Became Exterminated, Amer. Natural., XXI, Dec., 1887, pp. 1047-1054).

The sea lion (*Eumetopias stelleri*) was formerly quite abundant, but has now become nearly extinct on both islands, though still numerous in certain localities on the Kamchatkan coast. In 1895 I saw only one individual on Sivutchi Kamen at the North Rookery, Bering Island, but during the winter of 1896 nine sea lions were killed there.

The fur-seal (*Callotaria ursina*) being the chief subject of this report, needs no further mention in this connection.

The fate of the sea otter (*Latax lutris*) in the Commander Islands is highly instructive and interesting. When Bering and his unfortunate followers landed on Bering Island they found the sea otters so numerous that these animals furnished food for the entire crew during the whole winter. On their return to Kamchatka the following year (1742) they brought with them more than 700 skins of this costly fur. Then followed a period of reckless slaughter of these animals by the rapacious promyshleniks. Thus, in 1745, Bassof and Trapeznikof secured 1,600 skins; in 1748 about 1,350 were killed. The result was that within a very few years the sea otter almost disappeared from Bering Island, for Tolstykh's expedition obtained only 47 during the winter of 1749-50; Drushinin's men, in 1754-55, took only 5; while in the account of Tolstykh's second expedition, winter of 1756-57, it is expressly said that "no sea otters showed themselves that year." It is interesting to note that even in those days Copper Island offered a safer retreat for the sea otter, since Yugof, who also visited that island, returned home in 1754 with 790 skins.

While not actually and literally exterminated on Bering Island—Trapeznikof's expedition of 1762-63 secured 20 otters there—it did not become common there again, except possibly during an alleged sudden reappearance in 1772, until after the abandonment of the island, when the Russian-American company was organized. Upon the recolonization of the island the otters were found common in places; thus it is said that in 1827 no less than 200 otters were killed in one week at the Reef near the present Nikolski village (Slunin, Promysl. Kamch. Sakh. Komand. Ostr., 1895, p. 103). But the reckless slaughter of former days was resumed, and the sea otter long ago ceased to be a regular inhabitant of that island. Occasionally a solitary individual strays over from Copper Island, where the same careful management which resulted in the increase of the fur seal has succeeded in preserving and increasing the sea otter to such an extent[1] that I believe there is no other place in the world where so many sea otters can be seen at the present day. The condition of the herd is now such that 200 animals can be killed off yearly without detriment. The places where the sea otter have their rookeries are constantly guarded to keep intruders off. Shooting, making fire, or smoking is strictly prohibited near these places.[1] Only nets are now used to capture the otters, and if any females or yearlings are caught alive they must be set free. The number to be taken is determined in advance by the administration, and the hunting expeditions of the natives are undertaken in common under the leadership of the chief, though each hunter keeps the otter he secures. They are taken off their hands by the Russian Government at a certain fixed price.

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[1] As early as 1860 Captain Furuhielm writes: "According to the report of the manager of Copper Island, sea otters are increasing there, and I have issued the strictest orders to prevent their being disturbed." (Fur Seal Arb., II, p. 87.)

Of other marine mammals occurring at the Commander Islands, we may further mention four species of hair seals, viz, *Phoca largha*,[2] *fœtida*, *grœnlandica*, and *fasciata*; three species of ziphioid whales, viz, *Ziphius grebnitzkii*, *Berardius bairdii*, and *Mesoplodon stejnegeri*; a sperm whale (*Physeter macrocephalus*); several delphinoid whales, among which the terrible enemy of the fur-seal, the killer (*Orca gladiator*), as well as several species of fin-back whales.

The land mammals are few, the most important being the Arctic fox (*Vulpes lagopus*). These animals, which are now fairly common, yielding a handsome income to the natives, belong almost exclusively to the dark-bluish phase. Their economic importance will be treated of elsewhere in this report.

There are two rodents on Bering Island, but both have been introduced by the agency of man during late years. *Mus musculus*, the common house mouse, was brought to Bering Island in 1870 by the schooner *Justus* in a cargo of flour. The short-tailed red field-mouse (*Evotomys rutilus*), which now overruns the islands in vast numbers, was introduced from Kamchatka at a much later date, probably with the firewood. This is probably also the origin of the bats (*Vespertilio?*) which are said to have been seen at Nikolski during the last couple of years.

The introduction of the reindeer (*Rangifer tarandus*) will be mentioned elsewhere (p. 46).

BIRDS.

I have reported upon the birds in a separate volume (Results of Ornithological Explorations in the Commander Islands and in Kamchatka. By Leonhard Stejneger. Bull. No. 29, U. S. Nat. Mus. 1885; 382 pp. + 8 plates) and in a later supplementary paper (Revised and Annotated Catalogue of the Birds Inhabiting the Commander Islands; Proc. U. S. Nat. Mus. 1887, pp. 117–145 + 3 plates), to which I would refer the reader for detailed information. In the last-mentioned paper I enumerated 143 species of birds as having been collected in the Commander Islands. To these I can now add four species, viz: (1) *Rhodostethia rosea*, Ross's gull; adult female presented to me by Mr. Grebnitski (U. S. Nat. Mus., No. 162785); (2) *Gavia alba*, the ivory gull, a specimen of which Mr. Grebnitski presented to me (U. S. Nat. Mus., No. 151983); (3) *Eurynorhynchus pygmæus*, the spoon-bill sandpiper, two specimens of which were shot during the latter part of September, 1894, and sent by Grebnitski to the museum in St. Petersburg; and (4) *Milvus melanotis*, the black-eared kite, a mere straggler, taken once on Bering Island. The specimen was presented to the *Vega* expedition by Mr. Grebnitski (Palmén, Vega Exp. Vetensk. Iaktt., v, 1887, p. 294).

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[1] Except now in the southern part of the island, where shooting is allowed. Sea otters have recently increased at the Southeast Cape, and the shooting is permitted in order that the animals may be driven to the northern end of the island, where they can be watched and protected more effectually.

[2] During 1896 there were killed 49 "nerpi" on Bering Island and 22 on Copper Island.

One of the Commander Island birds (*Phalacrocorax perspicillatus*) deserves at least a passing notice, not only because we know of no other locality in which it has with certainty occurred, but because it has become extinct within recent years through the agency of man. The history of this rare bird (only 4 specimens exist in museums) is traced and full description given by me in a separate paper (Contribution to the History of Pallas's Cormorant; Proc. U. S. Nat. Mus., XII, 1890, pp. 83-88). In 1882 I fortunately disinterred a number of bones of this bird, which have been described and figured by Mr. F. A. Lucas (*tom. cit.*, pp. 88-94, pls. II-IV). An additional collection made by me in 1895 has also been elaborately described and figured by him. (Contributions to the Natural History of the Commander Islands.—XI. The Cranium of Pallas's Cormorant; Proc. U. S. Nat. Mus., XVIII, 1895, pp. 717-719 and pls. XXXIV-XXXV.) A preliminary note may be found in *Science*, November 15, 1895, p. 661.

FISHES.

A collection of littoral and river fishes (45 species) occurring at the Commander Islands, brought together by Mr. Grebnitski and myself, has been reported upon by Dr. Tarleton H. Bean. The report is published in the Proceedings of the United States National Museum, as No. 12 of the "Contributions to the Natural History of the Commander Islands." (Fishes collected at Bering and Copper Islands by Nikolai A. Grebnitski and Leonhard Stejneger, by Tarleton H. Bean and Barton A. Bean; Proc. U. S. Nat. Mus., XXIX, 1896, pp. 237-251, No. 1106.) Two of the cottoid fishes in their collections have since been described as new species by Barton A. Bean, viz: *Myoxocephalus mednius* and *Porocottus quadratus* (in Jordan & Evermann, Fishes of North and Middle America, II, 1898, pp. 1983 and 1998 respectively). A few additional species were collected by me in 1896 and 1897, viz: *Sebastodes glaucus*, *Hexagrammos lagocephalus*, *Oncocottus hexacornis*, *Histiocottus bilobus*, and *Bryostemma polyactocephalum*. For further details see Jordan & Gilbert's "Fishes of Bering Sea," in the third volume of this report.

TUNICATES.

Styela arctica has been described by Swederus (Vega Exp. Vet. Iakt., IV, 1887, p. 108) as a new species from Bering Island.

INSECTS.

Mosquitos are numerous on Bering Island, less so on Copper Island, and very annoying on the few otherwise pleasant days of which the summers of that region can boast. *Geometridæ* and *Microlepidoptera* are rather numerous, *Noctuidæ* less so. I have only seen one specimen of diurnal Lepidoptera, viz, a butterfly very much like *Vanessa urticæ*. Of the Coleoptera, the large staphylinid, *Creophilus villosus*, is very numerous on the seal-killing grounds. Mr. John Sahlberg has reported upon a few (9) Coleoptera and (1) Hemiptera collected by the *Vega* expedition (Vega Exp. Vet. Iakt., IV, 1885, pp. 61-68), one of which is described as new, viz, *Anisotoma abbreviata*, one of the *Siphidæ*. My own collections before 1896 were considerably larger and contained (besides the Microlepidoptera), according to Mr. M. Linell, 50 species, of which 34 are Coleoptera. These include all of Sahlberg's species except *Sitones lineellus* and *Oxypoda opaca*, so that the Coleoptera from the Commander Islands then numbered 37 species. Of these, no less than 12 species belong to the *Staphylinidæ.* The other orders are represented by 2 species of *Hemiptera*, 5 *Diptera*, 3 *Hymenoptera*, 2 of which are new and thus far only known from the Commander Islands, viz, *Mesoleius stejnegeri* Ashm., and *Stibeutes nigrita* Ashm., 1 *Siphonaptera*, and 2 Lepidoptera, viz, *Agrotiphila alaskæ* Grote, and a *Macroglossa* near *stetiarum Linn.*

It should be remarked that the insects collected of late years in the neighborhood of the main villages must not be given too great weight in determining the zoological relationship of the islands, for many have undoubtedly been introduced recently from Petropaulski, Kamchatka, in the large quantity of firewood shipped to the islands every year. In fact, some of the species collected by me in 1895 were taken on or near the wood pile.

In 1897 my wife and I made additional collections of insects both on Bering and Copper Islands. Mr. Barrett-Hamilton also collected quite a number, which, with characteristic generosity, he placed at my disposal to be presented to the United States National Museum. These collections are now being worked up, and a report on the insects thus far recorded from the Commander Islands is published in the appendix of the present volume.

MYRIAPODS.

The three species brought home by me have been determined by Bollman. *Linotænia chionophila* and *Lithobius sulcipes*, both from Bering Island, are known from other localities, but the species described by him as new, under the name of *Lithobius stejnegeri*, is the only one thus far found only on the Commander Islands (Bull. U. S. Nat. Mus. No. 46, 1893, p. 199).

ACARIDS.

The acarids collected by the *Vega* expedition have been described by Kramer and Neuman (Vega Exp. Vet. Iakt., III, 1883, pp. 519–532, pls. XLI–XLIV). No less than 5 new species were described from Bering Island, 4 of which were found only on the latter, as follows: *Nesæa arctica*, *Bdella villosa*, *Ixodes borealis*, *I. fimbriatus*, and *Gamasus arcticus*. Of these I obtained all but *I. fimbriatus*, and obtained five additional species, four of which are new.

SPIDERS.

It was my intention to get as nearly complete a collection of spiders as possible, and in 1882–'83 I succeeded in obtaining quite a number of species, which were turned over to the United States National Museum. They were lent to the late Dr. Marx to be determined, but the report was not finished before his death. The spiders collected during 1897 have been worked up by Mr. Nathan Banks (in appendix).

CRUSTACEANS.

The crustaceans collected have not been worked up as yet, except the entomostraca, which have been described by Prof. W. Lilljeborg, of Upsala, Sweden (On the Entomostraca collected by Mr. Leonhard Stejneger, on Bering Island, 1882–83. Proc. U. S. Nat. Mus., x, 1887, pp. 154–156). Five species were collected, of which I found

Branchipus paludosus, *Daphnia longispina*, and the new species *Diaptomus ambiguus*, in small fresh-water ponds at Ladiginsk, Bering Island. The other new species is *Eurycercus glacialis*, which, however, has also been found in Greenland and Vaigatch Island, at the entrance to the Kara Sea.

The crabs have been identified by Mr. J. E. Benedict, as follows: *Oregonia gracilis* Dana; *Telmessus cheiragonus* (Tilesius); *Eupagurus gilli* Benedict; *Eupagurus hirsutiusculus* (Dana); *Eupagurus middendorffi* Brandt; *Eupagurus nudosus* Benedict; and *Hapalogaster grebnitzkii* Schalfeef, recently described from Bering Island (Bull. Acad. Sc. St. Petersb., XXXV, No. 2, 1892, p. 335, fig. 3). Schalfeef identifies another species of *Hapalogaster*, also collected by Mr. Grebnitski on Bering Island, as *H. mandtii*.

MOLLUSKS.

Among the invertebrates, the mollusks have been most extensively collected and most thoroughly reported upon. The *Vega* expedition obtained 26 species, Mr. Grebnitski sent the National Museum 23 species, and I myself 45 species, out of a total of 75 species thus far collected. Of these, 10 are land or fresh-water species. Dr. W. H. Dall has published two reports upon the Commander Islands collections (Proc. U. S. Nat. Mus., VII, 1884, pp. 340–349; and IX, 1886, pp. 209–219). In the last paper he gives a full list of the species, including those of the *Vega* expedition, which have been reported upon by Westerlund and Aurivillius. The species of land and fresh-water mollusks thus far collected on the islands are: *Limax* (*Agriolimax*) *hyperboreus; Vitrina exilis; Hyalina radiatula; Conulus fulvus*, var.; *Patula ruderata*, var. *pauper; Pupilla decora* and *arctica; Acanthinula harpa; Limnæa ovata; L. humilis; Pisidium equilaterale.* The new species described from Bering Island by Aurivillius is *Pleurotoma beringi;* and by Dall, in his first paper, *Lacunella reflexa* (p. 344, pl. II, fig. 1–3), *Cerithiopsis stejnegeri* (p. 345 pl. II, fig. 4), and *Strombella callorhina* var. *stejnegeri* (p. 346, pl. II, figs. 5, 6).

An additional species of cephalopod may be recorded here. In 1896 I obtained two specimens taken at Copper Island, which Dr. Dall informs me seem to agree with the description of *Onychoteuthis bergii* Middendorff, described from Kamchatka.

WORMS.

At least one species of earthworm occurs, and several leeches, but, like the rest of the lower invertebrates collected they have not been reported upon as yet. Wirén has described a new species of chætopod from Bering Island, viz, *Potamilla neglecta* (Vega Exp. vet. Iakt. II, 1883. p. 422).

SPONGES.

A new variety (*arctica*) of *Esperia lingua* has been described from Bering Island (5–10 fathoms) by Fristedt (Vega Exp. Vet. Iakt., IV, p. 449, pl. XXV, figs. 20–24; pl. XXIX, fig. 18).

Mr. Lambe has worked up the sponges which I brought home, among which was one new species *Polymastia laganoides*, from Bering Island (Lambe, *op. cit.* p. 129, pl. IV, figs. 5, 5 *a–c*). The other Commander Island species enumerated by him are: *Halichondria panicea; Eumastia sitiens; Reniera rufescens; Esperiopsis quatsinoensis; Chondrocladia alaskensis;* and *Suberites concinnus* (Lambe, Sponges from the Western Coast of North America. <Trans. Roy. Soc. Canada, Sec. IV, 1894, pp. 113–138, pls. II–IV). The sponges brought home by me in 1897 have also been examined by Mr.

Lambe, and consisted chiefly of *H. panicea.* The collection contained in addition to these 5 specimens from Copper Island of a calcareous sponge which Mr. Lambe identifies as *Grantia monstruosa* Breitfuss, a species described lately from specimens obtained in the European Arctic Ocean.

PLANTS.

It was quite to be expected that Steller, as an expert botanist, should have made extensive botanical collections on Bering Island, and as he seems to have collected 211 species of plants there (see Pennant, Arct. Zool., Suppl., 1787, p. 38), he gathered more species than any of the various collectors who visited the island afterwards. Thus the combined collections of Dybowski, Wiemuth, and Kjellman include 144 phanerogams, while I have brought home nearly exactly the same number of species. The combined number of species, however, is much greater. Dr. Kjellman has published an interesting account of the flora as revealed in the first-mentioned collections (Vega Exp. Vet. Iakt., IV, 1887, pp. 281–309), while the late Prof. Asa Gray, in 1885, reported upon my collections in the Proceedings of the United States National Museum, VII, pp. 527–529, to which paper I added a few remarks (*ibid.*, pp. 529–538). During my trip in 1895 I had but scant time and facilities for collecting plants, and I confined myself chiefly to an unsuccessful search for *Cassiope oxycoccoides* in the exact locality and about the same season as I had collected it in 1882. In 1895 I was able to add a few species to the flora, which Dr. J. N. Rose, of the National Herbarium, has kindly determined for me as *Carex rariflora*, *Kœnigia islandica*, and *Ranunculus hyperboreus*. In 1897 my wife paid more special attention to the plants than I could give them with the result that several species have been added to the flora by her, viz, *Savastana odorata; Poa annua; Poa stenantha; Achroanthes diphyllos; Listera cordata; Cerastium maximum; Chrysosplenium kamtschaticum; Achillea ptarmica speciosa*, and *Lathyrus palustris*. These identifications are by Dr. Rose.

Dr. Asa Gray described one of my ericaceous plants as new, viz, *Cassiope oxycoccoides*, and the late Dr. George Vasey afterwards determined one of the grasses to be new and named it *Alopecurus stejnegeri* (Proc. U. S. Nat. Mus., X, 1887, p. 153; figured as fig. 2, pl. XXIV, Grasses Pacif. Slope, by Vasey, pt. I, 1892). As these species have not as yet been recorded from other localities they must be regarded, provisionally at least, as peculiar to the Commander Islands, and Dr. Kjellman's statement to the contrary effect (*tom. cit.*, p. 286) must be modified accordingly.

Dr. Kjellman's concluding remarks (*tom. cit.*, p. 289) are so interesting and important that I venture to translate them here, as follows:

> The flora of the Commander Islands is chiefly composed of two elements. One of these consists of species not entering the present artic region, or at any rate not to be regarded as belonging to the characteristic plants of this region. Most of these have their chief range of the present day extending over the islands and coasts of the northern Pacific Ocean. These form the bulk of the vegetation and determine its character. I regard them as arcto-Tertiary species, of which many, at least, have formerly had a wider distribution than at present.
>
> The other element consists of species which by their present distribution are indicated as arctic-Alpine. Several of these are to be regarded as among the characteristic plants of the present arctic regions.
>
> The Commander Islands, with the other Aleutian Islands, compose a floral district which forms a transition chiefly between three other districts, viz, the Manchu-Japanese, the Americo-Pacific, and the arctic district, although less closely related to the latter than to the other two, the northern outpost of which it may be regarded to represent.

Dr. Ernst Almquist has investigated the lichens of Bering Island and has published a very interesting account of his studies (Vega Exp. Vet. Iakt., IV, 1887, pp. 518–519, 521, 524–531), in which he gives and ingenious explanation of the curiously sculptured surface of the heath-like plant covering of the lower plateaus as due to a natural rotation of the plants composing it.

The general character of the flora is very much like that of the treeless regions of northern Europe, the most discrepant features being the splendid rhododendrons (*R. kamtschaticum* and *chrysanthum*) and the beautiful dark-maroon-colored Saranna lily (*Fritillaria kamtschatcensis*), the bulbs of which the natives gather for food in late summer. These plants indicate the close relationships to the flora of Kamchatka and the other Aleutian Islands. The plants of both islands are in most cases identical, but the manner of their immigration very likely has caused the occurrence of some species in one island which are absent in the other. Thus I have from Copper Island the conspicuous yellow flowering *Viola biflora* (also found by me at Petropaulski), which I failed to find on Bering Island, and which I could scarcely have overlooked.

The islands are completely destitute of trees, the few species of *Salix*, *Pyrus*, and *Betula* hardly ever rising above 6 to 8 feet, though I have a section of *Betula evermanni* from Bering Island with a diameter of 2 inches at the root. The *Pyrus*, in many places, forms extensive, nearly impenetrable thickets.

There are two tolerably well-defined belts of vegetation on the island, one a very luxuriant growth of higher plants in the lower valleys and plains, the other a heath-like formation above the former.

The luxuriance of vegetation in the lower belt, due to a rich soil and extreme moisture, is marvelous. Some species familiar to me from boyhood I could hardly recognize in the enormous specimens before me. Such plants as *Anemone narcissiflora* and *Geranium erianthum* sometimes reach a height of 3 feet, while in some particularly favored localities many acres of ground may be found covered with an almost impenetrable jungle of *Archangelica*, *Heracleum lanatum*, *Artemisia tilesii*, *Picris hieracioides*, *Spiræa kamtschatica*, *Aconitum*, *Veratrum album*, etc., often reaching a height of 5 to 6 feet. The exuberance of the umbellifers, particularly near the coast, is very striking, as shown in the accompanying photograph of *Heracleum lanatum* (pl. 15*a*). Near the beach this belt shows the usual influence of the neighborhood of salt water in the presence of such plants as *Lathyrus maritimus*, *Mertensia maritima* and *Ligusticum scoticum*.

The heath commences often quite abruptly above this belt, covering the surface of the beach terraces and the lower plateaus. Its presence does not depend so much upon the altitude as the character of the ground, for where the coast escarpment is low the heath formation commences even at an altitude of 20 to 30 feet. The fundamental plant of this formation is *Empetrum nigrum*, richly interspersed with *Loiseleuria procumbens*, *Cassiope lycopodoides* and other ericaceous plants, chiefly *Bryanthus*, and in the lower portions *Rhododendron chrysanthum*. Where the ground is marshy the salmon berry, *Rubus chamæmorus*, is rather common. Higher up on the mountain sides the vegetation grows more and more scanty and alpine in character.

The *pelagic flora* around Bering Island has been studied by Dr. F. R. Kjellman (Kgl. Svenska Vetensk. Akad. Handling., (n. s.), XXIII, 1889, No. 8, 58 pp., 7 pls), who observes that at Bering Island all conditions are found favorable to the development of a rich flora of *algæ* of the pelagic type. "It may even be said with safety that there are but few parts of the ocean the flora of which exceeds or even approaches that around Bering Island, in so far as multitude of individuals or number of magnificent forms are concerned."

NATIVE POPULATION OF THE COMMANDER ISLANDS.

The Commander Islands, when discovered in 1741, were uninhabited, and no trace of any former population has been found. For over 80 years the islands remained without a regular population, although they were visited almost yearly up to the end of the eighteenth century by numerous parties of Russian fur hunters, or promyshleniks, as they are called. In the early days it was the custom of these hardy frontiersmen to pass the first winter on Bering Island in order to secure provisions of sea-cow meat for their further expeditions. Sometimes the crews of several vessels wintered there at the same time; in one year at least (1754-55) numbering over 100 men. Those were gay days on Bering Island, when the sea cow, the sea otter, the blue fox, and the fur-seal were still plentiful. But these precious animals were soon exterminated, literally, as the sea cow, or commercially, as the three other species, and the inhospitable and dangerous shores of the Commander Islands were but seldom visited by sailors or hunters. About the year 1819, when Pitr Burdukofski says he was born on Copper Island, there were a couple of temporary settlements of hunters (mostly men) on the islands, 15 people (with one baidar) living on Copper Island and 30 on Bering Island. The settlements were on Copper Island at Palata, and on Bering Island at Staraya Gavan, Saranna, and Gavan.

When the colonial district of Atkha was established by the Russian-American Company, in 1826, it was decided to locate permanently a number of natives from the other Aleutian Islands, and consequently two colonies of Aleuts and half-breeds, the offspring of Russian promyshleniks and Aleut women, were planted on Bering and Copper islands. At the time of Lütke's visit to Bering Island, September 20, 1828, there lived on that island 110 inhabitants, "Russians, creoles, and Aleuts, employed in hunting fur-seals and foxes," but there was not then as yet established any permanent settlement on Copper Island. Hunting parties visited the latter island in baidarkas (Lütke, Voyage aut. Monde, I, 1835, pp. 276-277). A similar colony, located on the Kuril Islands, was made up mostly from natives of the Kadiak district. The colony on Bering Island consisted chiefly of natives of Atkha Island, or the Andreanovski group in general, while the Copper islanders were made up mostly of men and women from Attu. Although the inhabitants of the two islands by transfer and intermarriage have become considerably mixed of late, yet the difference in origin is still traceable in the dialects spoken, the Atkha people still preponderating on Bering Island, the Attu islanders on Copper Island.

Of late years two other elements have been added to the native population. As noted above, the Russian-American Company had located a colony of natives, mostly from the Kadiak district, on the Kuril Islands. When the latter islands were ceded to Japan these natives and their offspring declared their intention of remaining Russian subjects and were transferred to Kamchatka. After a miserable existence for several years in a small village outside of Petropaulski, they were located on the east coast near Cape Lopatka, in order to hunt sea otters. Their village was situated in a small bay just back of Cape Zholti.[1] They did not do well there, and during the last few years (1888) were transferred to Bering Island, their number helping to swell the total of the Commander Islands population. This was not a very desirable addition, however, and has not resulted in elevating the morals of the former inhabitants.

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[1] I have partly traced the history of these natives in an article in *Science* (n. s. II, July 19, 1895, pp. 62-63). When that was written I little thought that on the very day of its publication I should be living among these same natives on Bering Island.

The other addition consists in a number of girls from Petropaulski. It was found that the inbreeding of the natives on the two islands was not only having a deleterious effect upon the health and vitality of the community, but intermarriage had made the inhabitants so interrelated that it was difficult to find people who could be married at all without violating the intricate laws of the Russian Church governing marriage between relatives. Under these circumstances a number of unmarried young men from both islands were encouraged to go to Petropaulski and provide themselves with brides.

There is a great deal of discrepancy between the tables of the population given for the various years which are very difficult to harmonize. The chief sources are Dybovski's list (Wyspy Komand., p. 81) and that of Savitch (Otchet, 1893, p. 43), but up to 1878 these disagree so much that one of them must be radically wrong. Dybovski's list was, I believe, extracted by himself from the church records, and seems to be the more accurate one. In the following table I have therefore adopted his figures so far as they go. The figures for 1896 I owe to the kindness of Mr. Grebnitski; those for 1860 are from Tikhmenief.

The tables are meant to show only the native population, and not to include those temporarily living there, as the administrator, his assistant, the doctor, the midwife, the priests, the deacon, the kossaks, and soldiers, the company's agents, or their families. They would increase the total considerably, and the entire population of the Commander Islands in 1897 may therefore be set down as about 665 of both sexes.

Native population of Commander Islands, 1860 to 1897.

Year.	Bering Island.			Copper Island.			Total, both islands.	Remarks.
	Male.	Female	Total.	Male.	Female.	Total.		
1860	....	....	300	....	....	90	390	Tikhmenief.
1867	124	130	254	78	68	146	400	Do.
1868	120	125	245	75	67	142	387	Dybovski.
1869	120	114	234	77	70	147	381	Do.
1870	126	111	237	80	73	153	390	Do.
1871	128	113	241	82	75	157	398	Do.
1872	129	118	247	84	77	161	408	Do.
1873	133	125	258	85	76	161	419	Do.
1874	138	132	270	91	77	168	438	Do.
1875	139	132	271	90	81	171	442	Do.
1876	145	136	281	91	85	176	457	Do.
1877	152	133	285	89	90	179	464	Do.
1878	156	137	293	90	97	187	480	Do.
1879	165	144	309	87	99	186	495	Do.
1880	164	145	309	91	101	192	501	Do.
1881	158	151	309	96	104	200	509	Savitch, p, 43.
1882	164	155	319	97	105	202	521	Do.
1883	164	162	326	96	113	209	535	Do.
1884	177	163	340	100	120	220	560	Do.
1885	172	173	345	106	124	230	575	Do.
1886	163	166	329	113	129	242	571	Do.
1887	170	183	353	115	129	244	597	Do.
1888	160	166	326	138	142	280	606	Do.
1889	168	176	354	137	146	283	637	Do.
1890	170	175	345	133	141	274	619	Do.
1891	158	170	328	137	151	288	616	Do.
1892	164	166	330	147	149	296	626	Do.
1893	....	....	....	....	....	....	630	Savitch, p. 25.
1896	177	177	354	126	118	244	598	Grebnitski.
1897	176	180	356	131	118	249	605	Wachsmuth.

I have made a careful and detailed copy of the Bering Island church census on January 1 (old style), 1883, showing 165 males and 154 females, total 319, which agrees very closely with Savitch's figures for 1882. It is therefore probable that his figures are meant to represent the population at the end of the year. During that same year (January 1, 1883) there resided on Bering Island 15 persons not classed as natives.

Mr. Grebnitski has kindly furnished me with the following table relating to age and sex on the two islands, January 1 (old style), 1896:

Age.	Bering Island.		Copper Island.		Both islands.	
	Males.	Females.	Males.	Females.	Males.	Females.
Under 5 years	29	29	21	18	50	47
Between 5 and 10 years	24	27	21	17	45	44
Between 10 and 15 years	18	25	14	23	32	48
Between 15 and 20 years	22	23	15	17	37	40
Between 20 and 25 years	20	17	15	10	35	27
Between 25 and 30 years	11	10	12	7	23	17
Between 30 and 35 years	10	7	3	6	13	13
Between 35 and 40 years	16	12	4	6	20	18
Between 40 and 50 years	14	14	16	8	30	22
Between 50 and 60 years	8	5	4	3	12	8
Between 60 and 70 years and over	5	8	1	3	6	11
Total	177	177	126	118	303	295

At the end of the year 1896 there were on the Commander Islands, in addition to the 605 natives specified above, a foreign population amounting to 59 souls, classified as follows:

Designation.	Bering Island.		Copper Island.	
	Males.	Females.	Males.	Females.
Nobles	5	3	....	....
Clergy	6	7	3	3
Unclassified	....	1	2	....
Kossaks	4	2	....	....
Commoners	2	....	....	3
Peasants	2	2	....	6
Foreigners (Europeans)	2	1	1	1
Chinese	1	....	....	....
Sailors' children	....	1	1	....
Total	22	17	7	13

A total population on December 31, 1896 (old style) of 664 souls.

Apart from the sudden increase, due to the importation of the Zholti Mys natives, a pretty steady, though slow, increase of the population is noticeable from 1870 to 1893. This is rather interesting in a mixed population of but indifferent vitality, and, moreover, afflicted by a tendency to scrofulous and pulmonary diseases, the more so since a couple of rather severe epidemics of influenza and scarlet fever have swept over the islands of late years.[1] The question of the movement of this population during the years 1868 to 1881 has been studied by Dr. B. Dybowski,[1] whose tables relating to births and deaths are interesting enough to deserve a place in this connection.

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[1] As a result, the native population of Bering Island, according to Dr. Slunin (Prom. Bog. Kamch., etc., p. 57), between 1886 and 1891 suffered a decrease of 16, there being 111 births only against 127 deaths. His statement, however, that the population of Copper Island has not increased during the 20 years from 1872 to 1892 is not in conformity with the facts as shown in the above table.

Number of births and deaths on Commander Islands, 1868 to 1881.

Year.	Bering Island.						Copper Island.						Total, both islands.	
	Births.			Deaths.			Births.			Deaths.				
	Male.	Fem.	Total.	Male.	Fem.	Total.	Male.	Fem.	Total.	Male.	Fem.	Total.	Births.	Deaths.
1868	2	4	6	6	9	15	0	0	0	3	1	4	6	19
1869	4	2	6	4	13	17	2	3	5	0	0	0	11	17
1870	9	4	13	3	7	10	3	5	8	0	2	2	21	12
1871	5	3	8	3	1	4	2	2	4	0	0	0	12	4
1872	7	9	16	6	4	10	3	2	5	1	0	1	21	11
1873	7	7	14	3	0	3	2	2	4	1	3	4	18	7
1874	8	10	18	3	3	6	6	6	12	0	5	5	30	11
1875	5	6	11	4	6	10	2	6	8	3	2	5	19	15
1876	8	6	14	2	2	4	5	6	11	4	2	6	25	10
1877	10	5	15	3	8	11	4	6	10	6	1	7	25	18
1878	6	9	15	2	5	7	5	7	12	4	0	4	27	11
1879	11	12	23	2	5	7	3	6	9	6	4	10	32	17
1880	6	8	14	7	7	14	7	4	11	3	2	5	25	19
1881	7	7	14	9	3	12	6	5	11	5	5	10	25	22
Total	95	92	187	57	73	130	50	60	110	36	27	63	297	193
1896	7	8	15	8	6	14	8	6	14	4	7	11	29	25

Births and deaths on Commander Islands, according to months, from 1868 to 1881.

Mouth.	Births.									Deaths.								
	Bering Island.			Copper Island.			Both islands.			Bering Island.			Copper Island.			Both islands.		
	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.
January	3	12	15	3	5	8	6	17	23	4	3	7	2	0	2	6		9
February	5	4	9	2	6	8	7	10	17	2	3	5	1	2	3	3		8
March	6	3	9	6	4	10	12	7	19	2	3	5	0	2	2	2	5	7
April	3	4	7	2	8	10	5	12	17	3	1	4	2	3	5	5	4	9
May	7	5	12	8	3	11	15	8	23	6	4	10	0	1	1	6	5	11
June	7	9	16	4	4	8	11	13	24	1	17	18	1	5	6	2	22	24
July	4	7	11	3	4	7	7	11	18	2	4	6	3	0	3	5	4	9
August	6	8	14	2	0	2	8	8	16	5	9	14	8	2	10	13	11	24
September	10	9	19	5	3	8	15	12	27	7	5	12	6	2	8	13	7	20
October	17	8	25	5	7	12	22	15	37	4	2	6	3	3	6	7	5	12
November	7	9	16	1	5	6	8	14	22	6	4	10	3	0	3	9	4	13
December	8	3	11	3	6	9	11	9	20	4	5	9	2	0	2	6	5	11
Unknown	5	4	9	0	0	0	5	4	9	2	10	12	0	2	2	2	12	14
Total	88	85	173	44	55	99	132	140	272	48	70	118	31	22	53	79	92	171

The Commander Islanders, being derived from the other Aleutian Islands, do not differ from their relatives now under American authority in any essential point, and they naturally possess the characteristics, both good and bad, of the latter. By nature gentle, intelligent, and honest, the worst of their present vices have been acquired by contact with white men. I have spent twenty months among them, and I have only the most pleasant recollections of these simple-hearted people.

Notwithstanding their common origin, there is a marked difference between the natives on Bering Island and those on Copper Island. The former are more reticent, less ambitious, and, therefore, to most people, less attractive than the latter, whose gaiety and whim make a very favorable impression on the visitor. This difference seemed more marked during my visitt o the islands last year than on the former occasion, and, on the whole, it seemed as if the Bering Islanders had deteriorated. Even theft was not uncommon among the younger generation on Bering Island, though an almost unknown thing fourteen years ago. But even now real criminal offenses are not frequent. Occasionally a serious offender has to be sent to Vladivostok for punishment, but ordinarily deportation from one island to the other, extra service at the south rookery, or fines, are resorted to. The kossaks have often to arrest disturbers of the peace, resulting from the general spree on great holidays, or *prasniks;* but a night's lodging in the lockup sobers them up, and neither island has thus far needed a jail. As an illustration of the patriarchal ways of justice in vogue not many years ago, the following literal abstract from the station log of Bering Island is both instructive and amusing:

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[1] Wyspy Komandorskie, pp. 78–87.

> DECEMBER 3, 1877.—A married woman was on trial for stealing a petticoat from a clothesline. As she would not confess, the judges (natives) took two pieces of paper, on one of which was written "I have stolen," and on the other "I did not"; and it happened that she drew the one with the inscription "I have stolen." She was sentenced to wash the floor in the church.

The moral decline of the people I attribute largely to the recent introduction of intoxicating liquors. In 1882 it was forbidden the natives both to import spirits and to brew "beer" of sugar. As a result, they were tractable and contented, except as to this particular point. I was then told a story, the literal truth of which I can not guarantee, however, but it is to the point: A "revisor" arrived at the island to inquire if the natives were treated well, and he called a meeting to receive any complaints that they might have to make. The chief, after consulting with the other men, finally declared that they had absolutely nothing to complain of except the discrimination made against them, among all the children of the tsar, that they were not allowed to get drunk on the great church and state holidays, and that they were not conscious of any conduct which would merit such an unusual and severe punishment.

Whether this petition had any weight, or whether the American company, which had been instrumental in establishing the prohibition, was losing its influence, I do not know; certain it is that at my second visit to the islands the natives were allowed to import and consume many hundred dollars' worth of alcohol, the result being the usual one.

Until within the last few years the condition of these natives has been the enviable one of being the richest and most prosperous community in Bering Sea or along any of its shores. Not only the increase in the number of seal skins taken, and later on the increased payments for the skins when the number began to fall off, contributed to this end, but also the flourishing condition of the sea-otter and blue-fox hunt, due to the enforcement of wise regulations for the protection and chase of these animals.

The *sea otter* long ago became extinct on Bering Island, but on Copper Island it is still common. The "rookeries" or breeding places of this valuable animal, which furnishes the costliest of all furs,[1] are guarded and protected with jealous care. The animal, which is now nearing its extermination on all the American islands and shores, where it is not protected at all, is actually increasing on Copper Island, and yields, besides a handsome return to the Government, sufficient income to keep the natives in comparative affluence, as this island can easily produce 200 skins a year. The sea otter is there hunted by the natives in common, but the individual hunter secures the price for the animal he catches. Only nets are allowed in their capture. The Government buys all the skins from the natives at a certain fixed rate, 140 rubles for the first quality, 75 rubles for the second, and disposes of them to the company as per contract.

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[1] A single first-class sea-otter skin brought at auction in London, spring of 1895, $1,100.

I have made the following notes relative to a sea-otter expedition on Copper Island August 29, 1897:

All the "promyshleniks" now in the village (24) started this morning at 9 a. m. for Bobrovi Kaméni in eight boats, three and four men in each boat, and each man with four nets. Besides these, nets are also taken along and set for the men who are absent doing duty on the seal rookeries as watchmen, 112 nets in all. The nets are marked, and the sea otter belongs to the man in whose net it is caught, not to the one who sets the net. The nets are from 20 to 25 fathoms long and about 4 feet deep, with meshes 5 inches square. They are made by the natives of white American cotton seine twine. The thickness of twine used varies between No. 16 and No. 36, but the latter is chiefly employed. The floats are made of wood, and stones are used for sinkers and anchors. The nets are set at various distances from shore and at any angle to the shore, according to what the individual hunter considers the best. They are set in the afternoon and taken in the next morning. The sea otters usually seeking the lee side of the island, the nets are set accordingly.

The following table, based upon official returns,[1] shows the gradual increase until the present capacity of the island, about 200, was reached:

Number of sea otters killed on Copper Island, 1872-1882.

Year.	Sea otters.	Year.	Sea otters.
1872	9	1879	*a* 2
1873	14	1880	128
1874	54	1881	190
1875	48	1882	200
1876	33		
1877	68	Total	840
1878	94		

a Thrown out by the sea. There was evidently no hunt that year. Dybowski (Wysp. Komand., p. 64), upon the "authority of the overseer at Copper Island," gives 20 for 1879.

In his "Otchet" for 1893 the late Mr. Savitch presents a series of figures differing considerably from the above. Not knowing exactly how to reconcile them, I reproduce Savitch's figures, but would suggest that the latter probably refer to the years in which the animals were killed, while Grebnitski enumerates them in the year in which the skins were paid for, a solution corroborated by the close agreements of the totals between 1872–1881.

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[1] Grebnitski in Sbornik Glavn. Off. Dokument. Upravl. Vost. Sibir., III, 1882, Vip. 2, p. 91.

Number of sea otters killed on Copper Island, 1870–1893.

Year.	Sea otters.	Remarks.	Year.	Sea otters.	Remarks.
1870	11	Savitch, p. 14.	1882	120	Savitch, p. 17.
1871	28	Savitch, p. 17.	1883	110	Do.
1872	14	Do.	1884	26	Do.
1873	22	Do.	1885	146	Do.
1874	43	Do.	1886	110	Do.
1875	48	Do.	1887	124	Do.
1876	42	Do.	1888	179	Do.
1877	64	Do.	1889	127	Do.
1878	89	Do.	1890	185	Do.
1879	20	Do.	1891	175	Do.
1880	187	Do.	1892	196	Savitch, p. 25.
1881	124	Do.	1893	151	Do.

The returns of the sea otter hunt for 1896 were, according to Mr. Wachsmuth's report, as follows:

	Males.	Females.	Total.
Bering Island	2	2	4
Copper Island:			
In nets	47	42	89
Shot	20	17	37
Thrown out dead	4	0	4
Total	73	61	134

Of these 134 otters 131 were received by the company, viz, 120 belonging to the catch of 1896, and 11 to the fall catch of 1895. Of the skins thus accepted 27 were of the first quality and 104 of the second quality.

The *arctic blue fox* is common on both islands, most of the animals now found there being of the costlier dark phase, only a few white ones occurring occasionally on Bering Island. These are killed regardless of place or season, to keep the strain as pure as possible. The Copper Island fox skins are of a better quality, being larger and darker. The capture of the foxes is subject to as stringent and efficient regulations as that of the sea otter. The island is divided into a number of well-defined districts (19 in Bering Island, 8 in Copper Island) for fox-hunting purposes, in each of which there is a hut (*yurt* or *odinotska*) for the hunters. All the males between 18 and 60 years take part in the hunt, which ordinarily begins on November 10 (old style) on Bering Island, and November 20 (old style)[1] on Copper Island, closing December 31. In each district a certain number of men, forming a gang, are detailed. Each gang hunts in common, and the proceeds of the hunt are divided according to shares, or each man to take his own foxes, as each gang may decide. As the various districts are more or less productive, a certain rotation is established, so that each man has his chance at the best places as his turn arrives. Care, however, is taken that the old men are located in the more comfortable places.

The following table shows that the number of foxes decreases greatly when they are hunted for several successive years. The hunt is therefore suspended for one or two seasons, with intervals according to circumstances, in order to give the animals time to recuperate. The importance of the hunt is also shown and the relative scarcity of the white phase:

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[1] Since 1896 only after December 1.

Number of foxes killed on Bering and Copper islands, 1871–1883.

Bering Island.			Copper Island.	
Season.	Blue foxes.	White foxes.	Season.	Foxes.
1871–72	836	4	1872	190
1872–73	580	28	1873	457
1873–74	514	24	1874	447
1874–75	.....	.....	1875	.....
1875–76	1,087	50	1876	696
1876–77	573	19	1877	.....
1877–78	.....	.....	1878	.....
1878–79	789	.....	1879	601
1879–80	.....	.....	1880	503
1880–81	.....	.....	1881	.....
1881–82	1,447	20	1882	1,033
1882–83	872	13		
Total	6,698	158	Total	3,927

For the sake of completeness, I also present some figures relating to foxes taken from Savitch's Otchet, 1893. Like the sea-otter tables, they show some marked discrepancies, but the above table, which was furnished me by the late George Chernick, is to be trusted:

Foxes killed on Commander Islands, 1847–1861 and 1868–1891 (according to Savitch).

Year.	Bering Island.	Copper Island.	Year.	Bering Island.	Copper Island.
1847	772	64	1873	514+24	451+24
1848	.....	.....	1874	.....	447
1849	.....	3	1875	1,137	.....
1850	.....	384	1876	573+19	696
1851	.....	.....	1877	.....	.....
1852	1,900	516	1878	.....	619
1853	547	261	1879	.....	503
1854	435	220	1880	.....	.....
1855	.....	133	1881	533+47	908
1856	1,025	180	1882	874+14	525
1857	.....	2	1883	.....	.....
1858	.....	.....	1884	1,507+13	701
1859	1,233	776	1885	.....	.....
1860	584	488	1886	888+6	1
1861	.....	.....	1887	.....	1,311
1868	986+105	465	1888	.....	.....
1869	.....	300	1889	1,468+22	692
1870	550	209	1890	.....	.....
1871	870+20	326	1891	.....	.....
1872	580+28	390			

The blue fox catch on Copper Island for 1896 amounted to 994 skins, as follows:

	Males.	Females.	Total.
Killed	515	452	967
Found dead, January-March	11	9	20
Found dead, November	5	2	7
Total	531	463	994

The statistical details relative to the hunt are as follows:

Copper Island fox hunt, December 1–16, 1896.

Districts.	Number of traps.	Number of guns.	Number of hunters.	Foxes in traps.	Foxes shot.	Foxes found underneath the houses.	Sex.		Total.
							Males.	Females.	
1. Pestshani, near Gavan	19	2	2	25	5	....	9	21	30
2. Gavan	84	8	8	122	7	72	110	91	201
3. Zhiravoi	17	2	2	25	2	....	10	17	27
4. Senkina	15	2	2	16	5	....	9	12	21
5. Karabelni	115	14	14	204	6	....	115	95	210
6. Tchorni Mys	28	4	4	42	5	....	18	29	47
7. Glinka	184	19	21	311	32	....	191	152	343
8. Peresheyek	27	3	3	82	6	....	53	35	88
Total	439	54	56	827	68	72	515	452	967

There was no fox hunt on Bering Island in 1896, but about 17 foxes were found starved to death, 14 of which were accepted by the company.

The blue foxes must now be taken in steel traps exclusively. Shooting them is only exceptionally allowable, and as the foxes mostly live near the coast it is also forbidden to travel with dog sledges and to fire any shot near the coast after September 1 (old style). It was found that by digging them out of their holes females were mostly obtained, and this method has consequently been prohibited. The dried skins are sold to the company at a fixed price. As the natives are now paid 14 rubles for each first-class fox skin and 7 rubles for each second-class skin, it will be seen that the foxes are a valuable source of income to them.

Owing to the ease with which the natives could procure seal meat for food, they have paid but little attention to other means of subsistence, particularly as the ready money obtained from the company for skins and work secured sufficient variation from the company's stores, whence they also obtain their flour, hard bread, tea, sugar, etc., not to forget canned provisions. As a result, the sea fishery does not yield what it otherwise might. On Copper Island, however, the natives catch some cod and halibut. They have a tolerably good boat harbor and many boats. On Bering Island however, the lack of a sheltered harbor and landing-place is a great drawback. On the other hand, the rivers and creeks of Bering Island are filled with salmon during the summer months, thus yielding the natives an abundant supply of fish for themselves and their dogs. The Saranna River is particularly important in this respect. The salmon are here caught in a substantial weir built across the river at the village of Saranna. During each summer nearly all the women are kept busy cleaning and drying from 60,000 to 100,000 salmon (pls. 60, 61). The weir is kept open from Saturday night to Monday morning to allow fish to ascend the river and lake to spawn. The bulk of the salmon put up belongs to the two species "Krasnaya riba," or redfish (*Oncorhynchus nerka*), and kisutch, or silver salmon (*O. kisutch*).

Table showing number of fish dried and salted by the inhabitants of the Commander Islands during various years between 1868 and 1896 (chiefly from Savitch, Otchet, 1893, p. 63).

Year.	Dried.		Salted.		Authority.
	Bering Island (salmon).	Copper Island (codfish).	Bering Island (salmon).	Copper Island (codfish).	
1868	20,000	8,700	....	....	Savitch.
1870	60,000	1,500	30,000	300	Do.
1872	42,000	200	3,000	400	Do.
1874	20,000	75	1,000	90	Do.
1886	27,000	2,030	1,000	1,421	Do.
1892	54,000	9,400	2,110	11.150	Do.
1896	80,450	4,500	1,800	6,590	Wachsmuth.

There is very little game now to hunt on the islands. The natives are very fond of the meat of the various sea birds, especially early in spring, and being provided with modern breech-loading guns and an unlimited supply of ammunition,[1] the result is that birds have become comparatively scarce—very much so, in fact—near the villages. Ptarmigans (*Lagopus ridgwayi*) are, I believe, still numerous on Bering Island.

During their lease Hutchinson, Kohl, Philippeus & Co. introduced a herd of Kamchatka cattle on Bering Island and kept it at an expense entirely disproportionate to the benefits derived. The company has given up keeping cows, but the cattle have passed into the hands of the natives, while the white families on the island also have a few head to keep them supplied with milk. It has been supposed that cattle raising might have a future on Bering Island, but past experience disproves the prediction, at least with the present breed of cattle. It has even been suggested "that these sturdy cattle might be advantageously introduced into the Aleutian Archipelago," but aside from the fact that it requires a good deal of care and fodder to bring them successfully through the winter, even on Bering Island, the breed is highly objectionable from the fact that the cows refuse milk the moment their calves are taken away from them.

On the other hand, I firmly believe that with a suitable breed sheep raising could be made a success, not only on the Commander Islands, but on the American Aleutian Islands as well. The climate is not more severe nor more moist than on some of the Scotch islands, or the Faeroes, where sheep raising and fishing are the main industries. But, of course, if an experiment is to be made, it must not be undertaken with sheep from California or some other country with a climate differing widely from that of the islands. It is imperatively necessary that a race like the Scotch black-face be employed; otherwise, the experiment would be sure to be a failure; but with proper precautions, and under the guidance of experienced men, I feel convinced that sheep raising would be the proper solution of the food question in the Aleutian Islands.

On Bering Island the sledge dogs would be an insurmountable obstacle to the introduction of sheep. As a matter of fact, however, the dogs are now of but little use, and should be exterminated—the sooner the better. The increasing number of boats have made the dogs superfluous along the coasts and for inland transportation, particularly from the main village, Nikolski, a road could be easily built to the North Rookery. The introduction of a few Kamchatkan ponies would do the work much more satisfactorily, as proven by the success of the mules on the Pribilof Islands.

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[1] Mr. Kluge says the natives on Copper Island annually use 800 to 900 pounds of gunpowder.

In the fall of 1882 a couple of horses were brought over from Petropaulski, let loose, and allowed to take care of themselves during the entire winter, which was a rather severe one. The winter gales swept the level places nearly bare of snow, and the horses found more than plentiful food in the dry grass thus exposed. So far from suffering hunger, the horses in spring were found to be sleek and well fed; in fact, in better condition than when they arrived on the island. They were afterwards sold to a native, but died later, a circumstance undoubtedly due to the ignorance or lack of care of the owner.

The sledge dogs are still one of the most interesting features of Bering Island. There must be at least 600 dogs in Nikolski,[1] but while formerly they were allowed to run loose, and afterwards kept chained outside of the owner's house, Mr. Grebnitski has of late years banished all the dog pens to the sand hills back of the village, much to the improvement of good order and comfort in the village. Each dog has a hole in the ground large enough for him to lie down in while chained to a stout pole near by. Here they pass their days howling or sleeping when not out traveling. For traveling a number of them, mostly 11 or 13, are hitched in pairs to a low sledge. A trained leader is tied on in front. This is an intelligent and valuable animal, and is guided entirely by the driver's voice. In winter, on the snow, such a team will haul a load weighing 400 pounds, and I have traveled 40 miles in a day, though without any baggage worth mentioning. But they are also used in summer on the bare ground. Of course, the rocky places are avoided as much as possible, and the summer tracks are preferably located over the marshes and in the low places. On frequented routes, as between Nikolski and north rookery, or Saranna, the constant travel has worn deep ruts in the ground—in some places 2 to 3 feet deep. These ruts being veritable ditches, drain the surroundings, and are, therefore, usually in a very slippery condition, to which the droppings of the dogs add materially, making it fast if not pleasant traveling. Some of these routes are shown by dotted lines on the map of Bering Island (plate 91).

Most of the dogs differ greatly from the Kamchatkan dogs, belonging, in fact, to an entirely different race. They have large, hanging ears, and were originally brought to the island from Okhotsk. Of late years teams of Kamchatkan dogs, which have erect, pointed ears, and are very much like the ordinary Eskimo dogs, have been imported, as the original hang-eared dogs were degenerating from inbreeding, and now mongrels of all possible shades and with ears of all possible shapes are common enough. The hang-ear dogs are furthermore distinguished by having the regular dog bark, while the Kamchatkan dogs can only howl.

The recent introduction of reindeer into Bering Island seems to have been a success. Hutchinson, Kohl, Philippeus & Co., in 1882, by the efforts of Dr. B. Dybovski, secured 4 male and 11 female reindeer in Kamchatka, which were safely landed on Bering Island July 15. During the following winter 2 females were killed by natives, but the herd increased by the birth of 6 or 7 calves. The reindeer took up pastures in the southern, mountainous part of the island, and are said to have multiplied rapidly. I did not see them in 1895, but I heard estimates of their number varying between 600 and 1,000 deer. A careful selection of bucks for killing would add to the fresh-meat supply, and at the same time promote the rapid increase of the herd. In 1896 15 reindeer were killed for food, sex not stated.

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[1] According to Savitch (Otchet, App. No. 9) there were 200 dogs in 1868; 245 in 1870; 460 in 1874; 724 in 1886; 562 in 1892. On January 1, 1897, there were 503 sledge dogs in Nikolski, according to Mr. Wachsmuth's report.

It is not improbable that the reindeer might do well on Copper Island, in spite of the smaller size of the island, but I am inclined to the belief that the introduction of a *suitable, hardy race of goats* would be a better investment.

A few hens and tame ducks are kept in the villages on both islands, but on Bering Island they are not doing well on account of the dogs.

A glance at the meteorological tables, pages 22–25, will show that any agriculture, in the proper sense of the word, is out of the question. On Bering Island there is a half-hearted, half-successful attempt at raising a few vegetables. Formerly most of the native families had "gardens" at Staraya Gavan, where turnips and potatoes were raised with varying success. The place was entirely too far from the main village, however, and new gardens have been started at Fedoskia, on the west coast, a few miles south of Nikolski. In 1895 there was only one man who still had a vegetable patch at Staraya Gavan. I believe that this industry could be made more successful if the natives were taught proper methods. One common error now committed is that all the vegetables are planted entirely too close together. It would also be necessary to look out for hardy plant seeds and seed potatoes raised in a northern climate.

The *fuel* used by the natives consists of coal and birch wood, the latter brought from Kamchatka and sold by the company, and of driftwood collected by the natives along the beaches. The latter article is very uncertain and is now often very scarce, though formerly abundant enough. Coal, on account of the long transportation, is expensive, and, like the birch wood, requires cash to purchase it. A couple of shiploads of the latter are required every year, and while the supply in Kamchatka is almost limitless at the present time, yet it is not so accessible now at places where there are people to cut it and where it can be loaded into a vessel. With the decreasing number of seals affecting the revenues both of the natives and of the company, the day does not seem distant when the former will be unable to buy, while the latter may find it unprofitable to have a steamer constantly plying between the islands and Kamchatka. Knowing, moreover, that the fuel question was a grave one on the other Aleutian Islands and that peat bogs may be expected to be found on many of the latter, as they occur on Bering Island, I undertook, in 1883, to investigate them, and to bring samples of peat home for analysis. East of Nikolski, behind the sheltering hills and sand dunes, a large swamp extends back to the foot of the three Saranna Baidar Mountains, covering several square miles. In suitable localities large beds of peat of excellent quality are found. On June 15, 1883, I had a couple of men cut about 350 pieces of peat from near the surface. The pieces, averaging about 2 by 16 by 8 inches, were spread out on a hillside to drain, and ten days later they were stacked in pyramids in such a manner that the intervals between the pieces gave the air uninterrupted circulation between them.

When leaving the island in the autumn, I found the pieces of good consistency and took a fair quantity with me to have the properties of the peat tested. They were turned over to Dr. Fred. P. Dewey, then curator of metallurgy at the United States National Museum, who kindly furnished me with a report of his analysis of the peat, which he found of good quality. It should be observed that the peat was from the surface, and therefore not nearly so good as it would have been if it had been taken deeper down. Dr. Dewey's report has never been printed, and, in view of the great importance of this question, both for Bering Island and the other Aleutian Islands, I think it well to submit it in full:

REPORT ON PEAT FROM BERING ISLAND.

As received, the sample consisted of about 30 slabs of the peat, most of them of considerable size, so that it can be considered as a fairly average sample; since, however, it had been collected several years, it was unusually dry. It was first tested by building a fire under a small boiler. It ignited with great ease and gave off its volatile matter at a low temperature, forming a good, solid flame without much smoke and giving off a good amount of heat. It required only a small amount of kindling wood to thoroughly start the fire, and after it was once started and had been thoroughly observed it was left to itself, and at the end of five hours it still had vitality enough to ignite fresh material, showing that it had good staying power. If there had been sufficient material on hand to build a large fire, it would probably have held its fire for fifteen to twenty hours, but only a small fire could be built, and the result is very satisfactory. A small piece was cut off from each large piece and the small pieces properly ground and sampled for a chemical analysis, which yielded the following results:

Water	7.60
Volatile matter	51.97
Fixed carbon	22.06
Ash	18.37
	100.00

As might be expected from the time since the sample was collected, the analysis shows an unusually small amount of water, and while the ash is rather high, the whole analysis shows the peat to be above the average in its contents of actual combustible material, and that, therefore, it would undoubtedly form a very valuable fuel in the country where it is found.

As prepared for use by simply air-drying, peat frequently contains from 15 to 25 per cent of water, and unless artificial heat is used in drying it is not probable that this one could be dried to less than 20 to 25 per cent of water; and on this basis its composition would be—

Water	20.00	to 25.00
Volatile matter	45.00	42.19
Fixed carbon	19.10	17.90
Ash	15.90	14.91
	100.00	100.00

These results compare favorably with the following analysis of a peat from Devonshire, England, which has been used extensively for fuel:

Water	25.56
Volatile matter	35.41
Fixed carbon	29.30
Ash	9.73
	100.00

Should it be necessary to use artificial heat, it could, of course, readily be obtained by the combustion of a portion of the peat itself in a suitable designed furnace.

I am satisfied that this peat will make an excellant fuel, and that the proper steps should be taken to introduce its use among the natives of the region.

Most of the natives on both islands live in neat frame *houses*, built and presented to them by Hutchinson, Kohl, Philippeus & Co., instead of the damp and filthy sod huts (here called *yurt*) which they formerly lived in. If properly located and built, however, the sod house is well suited to the climate and the needs of the people, and the munificence of the above company ceasing with the expiration of the lease, the Zholti Mys natives, as well as many a new-wed young couple, have erected new sod huts. These are built over a wooden frame, lined inside with boards, and the site properly drained (pls. 15*b* and 16*a*).

Nowadays the males *dress* almost exclusively in imported ready-made clothes, and the women make themselves dresses of calico or woolen goods, though for heavy overcoats and capes they wear also imported ready-made articles. Even the latest fashions penetrate rapidly to these distant shores. My surprise may well be imagined at seeing girls there in 1895 wearing gay-colored waists with enormous "leg-o'-mutton" sleeves! Ready-made shoes are also used in great quantities, for, although a few men have been taught shoemaking, comparatively little repairing is done. The old home-made garments are going out of use. The old rain coat, made of dried seal guts, is being laid aside for the oil coat, and the native *tarbassi*—moccasins made of seal skin or the inside throat lining of the old bull seals—are giving way to rubber boots, though the hard times of late years have brought them into prominence again. Even the baidarka, the graceful skin canoe, is a thing of the past, as the sea lion has become nearly exterminated on the islands, and the same fate has befallen the large skin baidaras—great lighters made of a framework of wood over which was stretched sea-lion skins sewed together. The framework is taken apart and used for other purposes, and the steamers' boats do the work of the baidara.

The *municipal institutions* of the two Commander Island communities are particularly interesting, not only because they are peculiar, but because they differ so radically on the two islands. The system on Bering Island is one of nearly pure communism, while on Copper Island it may be termed individualistic by comparison. The local administration has of course a great power and influence, but the natives have also a great deal to say in regard to their own affairs. They elect for a certain term a chief and an assistant chief, subject to the approval of the admistrator or local governor. The chief, in a measure, represents the community, and through him all communications to the natives have to go. This is particularly the case with reference to the company and its agents, who have absolutely no authority whatsoever over the natives, much less over the chief. The men attend to their internal affairs, receive the Government's communications, and hold their elections in their assembly house. The chief's business, among other things, is to see that the governor's orders are executed, that work to be undertaken is properly done, and that the moneys coming to the natives are properly distributed, etc. If I wanted a team of dogs and sledge I could not arrange with any native I pleased, but had to notify the chief, who would then send me the one whose turn, as duty or privilege, it would be to furnish the dogs.

A specified tariff for all work is provided. On Bering Island the total proceeds from the seal killing, 1.50 rubles per skin, is paid into the community fund and then distributed according to shares, each family, according to the individual rating of the members, receiving a certain number of shares and fraction of shares. For this the able-bodied men have to do the community work, including the sealing, without further compensation. On Copper Island an entirely different system prevails. There each family is paid for each skin which a member of the family brings to the salt house. Hence men, women, and children are engaged in the work, each family trying to bring in as many skins as possible. This system has been found necessary there, as the population would have been entirely inadequate to handle the catch if the Bering Island scheme had been adopted. It has resulted in overworking the Copper

Islanders, especially the females; but I am not certain that their more cheerful and independently open character, as contrasted with the more sulky and indifferent aspect of the Bering Island natives, is not due to the competition on one hand and the paralyzing communism on the other. The Copper Island population also forms a "community," of course, but its income and expenses are very different from that of Bering Island. The amount and manner of raising the income varies according to the decision of the natives. Sometimes a certain drive of seals is set aside for the community fund, sometimes the proceeds of sea otters killed with the rifle, etc. The expenses are few and small; as, for instance, the salary to the clerk or secretary (5 rubles a month), but the chief outlay is for whisky (or spirits), which is bought for the community by the barrel and divided on the great church and imperial holidays.

The *religion* of the natives is, of course, the orthodox Russian Greek Catholic faith. They have built a fine and expensive church on each island. They also support a priest on each island, and on Bering Island an assistant priest or "diakon." The moral plane of the church—its methods, men, and members—is similar to that of the same institution in Alaska.

Schools are provided for both islands and housed in roomy and well-lighted buildings, very creditable in every respect. The children are provided with all the modern improvements in school furniture, as well as apparatus for object lessons, maps, and colored charts of animals and plants decorating the walls, on which, over the teacher's rostrum, also hang the portraits of the Tsar and the Tsarina. Whether the knowledge received by the boys and girls is up to the fine apparatus I am not able to say. Any way, the boys used to write a good hand, at least when the late Mr. Volokitin taught them. I also saw the apparatus of a modern-school gymnasium, but as it was outside the schoolhouse and being painted dead black, I surmise that the authorities had come to the conclusion that it was carrying coal to Newcastle to give the outdoor children of Aleut extraction the additional physical exercise of indoor gymnastics.

A *doctor*, appointed and paid by the Government, is now stationed on Bering Island, with a good drug store on each island. He has for an assistant a "feltcher" or hospital steward located on Copper Island. The midwife, sent out from St. Petersburg by the authorities there, must also be regarded as the doctor's assistant.

a. BERING ISLAND.

GENERAL DESCRIPTION.

Bering Island, the northwestern island of the Commander group, is situated between (approximately) 55° 22′ and 54° 42′ north latitude, and 165° 40′ and 166° 41′ east longitude (pl. 91). Its greatest length from northwest to southeast is a little less than 50 miles, the average width being about 10 miles.

Two outlying islets, both not far from the northwestern extremity, properly belong here—*Toporkof Island*, a flat topped, low island, about 2 miles west of the main village, and *Ari Kamen*, on older charts usually called Sivutchi Kamen, a higher basaltic rock (173 feet high), with a two-peaked top, 4½ miles farther west.

The southern two-thirds of Bering Island are exceedingly mountainous, with peaks rising to about 2,200 feet. The maximum elevation is nearer the western side than the eastern, and the rise from the sea consequently more abrupt along the former coast, the mountains sloping more gently toward the east. The valleys, as a rule, are shorter, narrower, and V-shaped on the west side, longer and more open on the other. The passes are usually high, 600 to 1,000 feet, but at one place, viz, between *Gladkorskaya* on the west coast and *Polavino* on the east, the two valleys are continuous, with a very low watershed, thus dividing the mountains into two separate masses. In these the peaks, ridges, and intervening valleys are distributed without any apparent regular system. In the northern mountain mass, however, it is easy to recognize a dominating central stock between *Podutiosnaya* and *Buyan*, from which several of the largest streams of the island radiate west, north, and east, as, for instance, *Podutiosnaya*, *Fedoskia*, *Kamennaya*, the *Staraya Gavan* River, and the *Buyan* River. The most conspicuous mountain of the southern mass, and in fact the highest on the island, is the one which I have named Mount Steller.[1] It is located just south of the low valley between Gladkovskaya and Polavino, mentioned above, and is particularly impressive and beautiful viewed from the latter place. The mountains grow more forbidding and precipitous as the southern extremity of the island is approached, the last cape, a bold and knife-sharp promontory, the Stotchnoi Mys, better known as *Cape Manati*, being particularly picturesque.

The northern third of the island has an entirely different aspect from the remainder. In a general way it may be described as being low, the highest elevation being but slightly more than 600 feet. In reality it consists of a series of usually well-marked terraces. First comes the present beach followed by a steep coast escarpment averaging about 30 feet. In the deep bays this escarpment recedes inland so as to inclose the lakes formed by the rise of the land, and the heaping up by the sea of gravel and sand in front of them. Then follows a strip of varying width of nearly level or gently sloping land to the base of an intermediate, often abrupt, terrace, which brings us to an elevation of from 200 to 300 feet. The level following leads to the next and last rise, which is the highest, but also usually the most gentle, though in some places still quite precipitous. The level above this rise forms either large plateaus with a somewhat undulating surface, or the tops of singularly regular, flat-topped table mountains, which the natives, from their appearance suggesting overturned boats, have given the graphic name of Lotka, or Baidara, mountains. There are two groups of these table mountains, both very conspicuous when one approaches at sea the main village, viz, the *Severnie Lotki*, two very regular and round tables, between 3 and 4 miles (nautical) north of Nikolski, and the *Saranskie Lotki*, three equally well-marked, though less regular, mountains, about 5 miles distant to the northeast, on the west side of the great Saranna Lake. The highest altitude of the former group I have measured to be 577 feet; of the latter, 617 feet. The two main plateaus, which are situated north of the great lakes, are the *Northern Plateau* between Cape Zapadnie and Saranna, and *Tonkoi Plateau* from the latter place, where a deep cut, in which flows the Saranna River, separates the two plateaus, to East Tonkoi Mys, the *Cape Waxell* of many charts.

Between the terraced plateaus, which form the foothills and northern extension of the mountainous southern portion of the island, and the two detached table-lands named above, there is a depression extending across the island, which is filled by one very large and a number of smaller lakes, as well as by extensive swamps.

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[1] Deutsche Geograph. Blatter, VIII, 1885, p. 240.

The large lake alluded to, *Saranna Lake*,[1] is quite an imposing sheet of water for so small an island, covering, as it does, an area of about 20 square miles. It connects with the sea at the Saranna village, on the north shore of the island, by means of a short river less than a mile long. The level of the lake is about 40 feet above that of the sea. From the western end of this lake there is almost continuous communication through a small swamp with two smaller lakes, which empty into the sea at the western side, through the *Ladiginskaya* River. A somewhat larger lake, the *Gavanskoye Ozero*, occupies the center of a large swamp immediately east of the main village. The stream by which it discharges its water passes the latter, and is Steller's Osernaya Reshka. The low land between the lake and the sea is protected near the latter by several rows of high sand dunes from the village to Ladiginsk.

It is a curious fact that Steller (Neuste Nord. Beytr., II, 1793, pp. 266–267) describes this lake as the largest on the island, and that he has entirely overlooked the existence of Saranna Lake. It is pretty good evidence that Steller did not visit that part of the island personally (unless possibly when it was covered with ice and snow) and explains also his omission of mentioning the great North seal rookery. There are a few small lakes, or rather ponds, in the southern mountainous portion, which need no special mention, except the one in *Lissonkovaya Bay*, as the natural conditions there are a miniature reproduction of the Gavanskoye Ozero. It may be added that Lissonkovaya is Steller's Yushin's Valley.

Bering Island has no sheltered harbors, and the few anchorages are indifferent or even dangerous under anything but the most favorable circumstances. The principal anchorage is in the corner off Nikolski, but with southerly or westerly winds it is not safe. It can be approached from the west by keeping close to the south shore of Toporkof Island, in order to avoid an outlying rock off the so-called Vkhodni Point, or Reef. The channel north of Ari Kamen and Toporkof is very dangerous and should be avoided. Farther south, on the same side, are two larger bays, Gladkovskaya and Lissonkovaya, but they are open and no landing can be effected in rough weather. Lissonkovaya offers, however, excellent shelter for even large vessels in northerly and easterly gales; anchorage in 7 fathoms, with sandy bottom. On the east side is Staraya Gavan, the "Old Harbor," where there was formerly a settlement. The bay is small and narrow, with dangerous reefs on both sides.

These reefs are quite a feature of the Bering Island shores. In the northern portion they are mostly of volcanic nature, but in the mountainous portion they consist of stratified rock on edge in such a manner that many of them, especially at Tolstoi Mys and northward, when bare at low tide have the appearance of plowed fields with furrows of great length and regularity. On the stretch of coast just mentioned these reefs form a nearly continuous belt, one-fourth to one-half mile wide, and parallel to the beach. A narrow channel of somewhat deeper water, though only deep enough so that a large boat can be barely pulled and pushed through at low water, extends the whole length between the beach and the reef belt, which is covered by high tide. The continuity of the reef is only broken where some larger stream empties into a slight indenture of the coast, as, for instance, at Komandor, at Polavino, and at Buyan.

The main settlement is at *Nikolski*,[2] so named in honor of Mr. Nikolai Grebnitski, situated at the inner corner of the little bay east of Toporkof Island (pl. 17). The houses are built in several rows on the raised beach at the mouth of the Gavanskaya Reshka and partly upon the sandy slope of the adjacent hills, and being mostly frame structures are painted in many gay if not always tasteful colors. Prominent also in this respect the new church, dedicated to St. Nicolas, raises its yellow dome over a grass-green roof, while the body is painted pink with white and sky-blue trimmings! The old church of St. Inakenti is still standing, dismantled and neglected.

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[1] On some maps called Fedoskia Lake, a name unknown on the island.

[2] On some maps called Grebnitski Harbor, or Grebnitskoye Seleni.

At the western end of the village is located the new Government building with offices for the administrator and the doctor, and next to it the new schoolhouse, both rather large, but uninteresting, lead-colored structures (pl. 17*b*). In the center of the village is located the company's dwelling house for the agent (pl. 18*a*), painted a friendly white, and surrounded by the magazines, stores, stables, bath house, etc. Beyond is the administrator's dwelling, unpretentious, but comfortable (pl. 18*b*). The sod huts are relegated to the rear, and, hardly differing from the surrounding grass, are very inconspicuous (pl. 15*b*).

At *Saranna* (pl. 61) there is quite a village of small houses and huts for the women in summer, when they live there in order to put up the large salmon catch. A small frame chapel was being built in 1895 on the brow of the hill back of the village.

The summer village at *Severnoye*, or the north rookery, will be described under the head of the latter. There was formerly also a temporary village at Staraya Gavan, to accommodate the people during the planting and harvesting season, but a new one has been built in its stead at Fedoskia, not far from Nikolski.

SEAL ROOKERIES.

It was on Bering Island that Steller, in the spring of 1741, discovered for the first time the rookeries and breeding grounds of the fur-seals which he had previously observed traveling northeastward toward unknown regions. His classical descriptions, so well known to all naturalists, need not detain us here, except in so far as they relate to the extent and location of the rookeries. Unfortunately, his works contain very little bearing directly upon this question. In his "Beschreibung der Bering Insel" (Neuste Nord. Beyträge, II, 1793, p. 289) there are a few observations, however, which throw some light on the subject. On the 29th and 30th of April (new style) the shipwrecked crew had killed the first bulls just arrived. Steller at once concluded that they had found the breeding habitat of these animals and hoped for more to follow. He says:

> In this hope we were not deceived, for numberless herds soon followed, filling the entire coast to such an extent that one could not pass by without danger to life and limbs; nay, in some places where they covered the whole shore we were often obliged to travel over the hills and rocky places. * * * *These animals landed only on the southern side of the island,*[1] *opposite Kamchatka, consequently at least 18 versts from the nearest place to our dwellings.* * * * [This was a long way to carry the big bulls, the flesh of which, moreover, was very unpalatable.] But we soon discovered that another smaller kind of fur-seal, grayish of color, which arrived with them in still greater numbers, had a much tenderer and more palatable meat, without odor, which consequently could be eaten without nausea. *We discovered also a nearer road to these directly south from our dwellings*, scarcely more than half as long as the former.

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[1] Steller applies the term "south side" to the entire shore, which from our better knowledge of the topography of the island we would call the western shore. It is evident from various statements in his works that he did not visit the true northern shore between Cape Waksell and Zapadni Mys.

From these quotations it is perfectly plain that at the time of the discovery of Bering Island there were no breeding grounds or rookeries on the east side of the island; that there were well-filled breeding grounds on the west side; that these were situated on the shore where now are located the few hundred females forming the Poludionnoye, or South, Rookery, and that vast numbers of bachelors hauled up in Lissonkovaya Bay, where there are none now, nor have there been any apparently within the memory of the natives residing on the island.

The destruction of this hauling ground must be credited to the same parties who accomplished the extermination of the sea cow in twenty-seven years.[1]

At the present day there are only two distinct rookeries on Bering Island, the principal one being located on the northern coast of the island, the other, a small affair, on the west coast.

THE NORTH ROOKERY. (Plate 94.)

The great North Rookery (*Severnoye lezhbishtche*) is situated on the northermost prolongation of the island (Severni Mys; also called Cape Yushin) about 11 miles from the main village, Nikolski, and about 10 miles from the northwest cape, Zapadni Mys. The north plateau of the island recedes here from the sea, leaving a broad, level tundra, which slopes gently northward toward the sea, ending abruptly in a steep escarpment, about 30 feet high, between which and the water a flat beach, about 400 feet wide, extends all around the point.

From this beach a long, rocky reef, of volcanic origin, extends for half a mile nearly due north, ending in a somewhat isolated high rock, the so-called Sea-lion Rock (*Sivutchi Kamen*). The terminal half of this reef is very low and, with the exception of the scattered larger rocks, under water at high tide; in fact, it requires very low water to be able to walk out to the Sea-lion Rock. The basal half is formed by a slightly raised, long and narrow peninsula, about a quarter of a mile long by 400 feet wide, the central portion of which constitutes a hard, gravelly beach about 10 feet above mean tide, and gently sloping toward the water on both sides, and fringed, except at the base, by the rocky reef. The northern two-thirds of this gravelly central portion is covered with fragments of shells of mollusks and echinoderms, so that it appears quite white, for which reason this part of the rookery is often spoken of as "the sands;" the basal third is covered with a very rank growth of *Elymus mollis*, continuous with the fields of the same grass which line the inner portion of the beach up to the escarpment. The vegetation is now gradually extending in a wedge-shaped point northward over the central part of "the sands." Several isolated rocks surround the rookery on both sides, as well as numerous sunken reefs.

From the base of the projecting point thus described, which is specifically designated as the Reef Rookery (*Riforoye lezhbishtche*), the coast trends east and is fringed with the same rocky reef as the rookery itself; but the seals do not haul up on these rocks, and they form no part of the rookery. The bay thus inclosed is comparatively shallow and sheltered, forming the principal playing ground of the pups. Here they learn to swim. Near the south shore the rocks mark off a series of shallow lagoons.

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[1] L. Stejneger, How the Great Northern Sea Cow (*Rytina*) Became Exterminated. American Naturalist, XXI, December, 1887, pp. 1047-1054.

From the western side of the "Reef Rookery," the base of which is here marked off by a detached rock, called *Babin*, or Babinski Kamen, the coast trends south-southwest. The beach shows the same characteristics, viz, an inner grass-covered belt, followed by a narrow, pebbly belt more or less whitened by broken shells and fringed by an outer rocky reef, which by low water embraces innumerable very shallow lagoons.

The grassy belt is widest (fully 400 feet) toward the reef, and the escarpment is here nearly obliterated by a little creek coming from the south. Its mouth is usually dammed up by the pebbles and gravel thrown up by the sea, and the grassy belt in this locality is therefore intersected by numerous connected pools of nearly stagnant water.

Farther south the escarpment again assumes its precipitous aspect and approaches nearer to the beach.

About five-eighths of a mile from the base of the "reef" the rocky beach projects again a little and, as the coast line beyond takes a more southerly turn, a corner is formed which the natives designate as *Blizhni Mys*. Just before this "cape" there is an expansion of the gravelly part of the beach which, like "the sands" of the reef, serve the seal hauling up in this neighborhood as a "parade" ground. This portion of the beach is now called *Kishotchnaya*. The patch of breeding seals located here are known as *Kishotchnoye lezhbishtche* or (rarely) *Blizhnoye lezhbishtche*.

Beyond Blizhni Mys the reef fringe, as well as the grassy belt, again expands, the escarpment retreating from the coast, only to reapproach farther south at another promontory which is well marked by two high, grass-covered, mound-like masses of rock, the so-called Great *Maroshishnik*, or Maroshnik, and Little Maroshnik. Beyond this point the coast forms another slight bay, fringed with reefs, like the foregoing, but not so wide. This is *Tizikof*, and as this is the last point where seals are known to have hauled up *regularly*, it may be regarded as the southern end of the great North Rookery.

The *killing grounds* are located on the gentle slope (about 3 in 100) above the escarpment, about 600 feet southeast of the base of the reef. The ground is here smooth and covered with a short, fine grass. The upper end is pitted all over with holes dug 4 to 6 feet deep and about 6 feet wide, used by the natives as "silos," into which they place the seal meat, intestines, etc., destined for winter food for the sledge dogs. In addition, boxes and barrels are likewise scattered over that part of the ground, and in these the natives salt the seal meat for their own use (pl. 19*a*).

The *driveways* on this rookery are short and easy. From the reef the drive is scarcely three-eighths of a mile long, for the least part over the rocky beach, and for the greater portion through the shallow lagoon at the base of the reef and across the fields of rank grass. The ascent up the escarpment is scarcely 30 feet high, with an incline of about 35°. The road there is worn perfectly bare of vegetation and in wet weather is somewhat slippery, but not enough so as to cause a serious impediment to the drive.

The driveway from the southern end of the rookery is considerably longer, from Kishotchnaya, for instance, nearly three-fourths of a mile; but as it is partly over the same beach upon which the seals themselves haul up and travel about with ease, and partly over the inner grassy belt of the beach, no special hardship is involved. The killing grounds are reached from the west side, where the escarpment is locally interrupted, and the gentle slope beyond extends down to the water.

The company's *salt house* is located 500 feet north of the killing grounds, at the extreme north end of the escarpment, and its reddish-brown walls and roof are visible all around for a considerable distance, being, in fact, the best landmark on this part of the island. It is a frame building, originally 45 by 26 feet, with a later eastern addition 20 by 24 feet. On the north side a plank "chute" and stairs lead down the escarpment to the beach below. (Pl. 24).

Southeast of the killing-grounds, about 1,200 feet from the beach, and between 60 and 70 feet above the sea, the mud-hut *village* of the natives, where the men live during the killing season, is located, and directly in front, north of the new huts, the only wooden dwellings of the place—one belonging to the Russian Government, in which the kossak and his family reside, the other (16 by 20 feet) built by the company for its employees. Formerly the company's "sealer" lived in a small frame hut just east of the salt house, but this is now used for storing salt in sacks, while the kossak occupied a mud hut or yurt a little farther east (pl. 25*b*).

There has of late years been several distinct yurt or mud-house villages at this rookery. The first one was situated just back of the coast escarpment, west of the salt house, and between it and the present driveway, scarcely more than an eighth of a mile from the rookery. This was inhabited until 1877. In 1878 Mr. Grebnitski ordered the village to be moved back and the new yurts were built an eighth of a mile southeast of and farther up on the hill than the former. The yurts, or barabras, were low and small and dark, musty and dirty, and have recently become entirely unfit for use. A series of new ones have now been erected and others are still being built immediately east of the former site, and these are in every way supplied with "modern improvements," inasmuch as they are comparatively large, dry, and provided with windows. They are built entirely above ground, and constructed of uprights rammed into the ground and covered on the inside with boards nailed on lengthwise. The walls and roof are then covered with a thick layer of sod (pl. 16*a*). On the whole, they are rather comfortable and warm, being certainly more suited to the climate and the wants of the people than the ordinary frame houses.

The appended map of this rookery (pl. 94) is the result of a traverse plane table survey made July 9 to 19, 1895, in the intervals between the rain and fog. A base line, exactly one-fourth of a statute mile long, was carefully measured off on the level ground to the west of the salt house. About 100 angles, from 14 stations, were measured. Another map of the same rookery was made by me in 1882–83, but on a considerably smaller scale, by means of an azimuth compass and pediometer. The new and more detailed survey confirmed the accuracy of the old map. There has never been published any map of this rookery.

THE SOUTH ROOKERY. (Plate 98.)

The South Rookery of Bering Island (*Poludionnoye lezhbishtche*) is now a very insignificant affair. As mentioned above, it is the only remnant of the countless number of seals which Steller saw on this side of the island. Situated at 55° 57′ north latitude, on the west coast of the island, halfway between Northwest Cape and Cape Manati and nearly 16 miles in a straight line from the village Nikolski, it occupies a narrow, curved beach under the steep bluffs of the coast escarpment, which here rises perpendicularly from 60 to 100 feet high. A beautiful waterfall in the next bight to the east forms a very conspicuous landmark (pl. 32*b*), and three-fourths of a mile to the westward is one of the most perfect natural arches, which I have named Steller's Arch (pl. 27*b*).

The *rookery beach* is hemmed in both at the west end and the east by projecting spurs of the escarpment, and at the corresponding corners long rocky reefs run out into the sea, inclosing and protecting a shallow bay, which, in spite of the openness of the coast, forms a safe harbor for the pups. The beach itself, hardly 100 feet wide, consists of an outer pebbly and rocky portion, with a rather steep incline toward the water, and an inner narrow and level belt covered with very tall vegetation, mostly *Elymus* and *Heracleum*.

The breeding seals occupy part of the pebbly beach, also hauling up on the outlying rocks of the reef.

The *driving* is made along the beach toward the east, and although not long, the entire distance being about 2,000 feet, is somewhat harder than on the North Rookery, as the seals have to be driven mostly over sand and round loose stones. The ascent to the *killing grounds* is steep and high, about 50 feet, leading from the boat landing up past the house, where the few natives live, and the small *salt house* beyond (pl. 32*a*).

The accompanying map of the south rookery (pl. 98), as the title indicates, is but little more than a sketch map. The time I had at my disposal was very limited, and did not suffice for a very accurate survey, or to measure off a reliable base line. However, it is an improvement on the base map of plates 96 and 97, the latter having been placed on the plane table in 1897 and corrected. The photographs I secured, however, testify amply to the general correctness of the map, and it is confidently asserted that the relative distances and angles are sufficiently accurate for all practical purposes. It is the first map published of this rookery.

b. COPPER ISLAND.

GENERAL DESCRIPTION.

Copper Island (*Ostrof Miedni*), so called from the native copper, of which small quantities have been found from time to time near its northwestern extremity, lies between 54° 53′ 30″ and 54° 33′ 30″ north latitude and 167° 28′ 30″ and 168° 9′ east longitude (approximately). It is very mountainous, long and narrow, the length being nearly exactly 30 miles, the average width about 2 miles. The general trend is northwest to southeast, like that of Bering Island, from which it is distant only about 29 miles (pl. 92).

The northwestern extremity is formed by a projecting cape, continued in two characteristic and bold, detached rocks, the Sea Otter Rocks, *Bobrovi Kameni*. From this point to the southeast end, which is marked by several smaller conical rocks, the island consists of a backbone of peaked mountains from 1,000 to 2,000 feet high and connected by ridges varying from 500 to 900 feet high. Only in two places is this backbone broken, viz, near the northern end, where the Bobrovi Valley, between Pestshanaya Bay on the east side and Bobrovaya Bay on the west shore, cuts deep down to about 350 feet above the sea, so that Copper Island seen from a distance—for instance, from the opposite shore of Bering Island—looks like two distinct islands. The other place is near the south end. A very narrow and low neck only 900 feet wide and 75 feet high, very properly named *Peresheyek*, or isthmus, separates the mountains of the south end from the rest of the island.

The highest mountain on the island is *Preobrazhenskaya Sopka*, which rises precipitously above the main village. I have measured it with an aneroid twice, the height being 1,925 feet.[1]

Narrow, deep valleys cut into the sides of the island vertically to its axis. A kettle-shaped end with steep walls usually terminates these valleys, whence originate small creeks or rivulets which occupy the narrow bottom. The sides of the valleys are often quite smooth, the detritus consisting of small, sharp-edged pebbles, often forming long, unbroken slopes with angles from 30 to 40 degrees. The ridges between the valleys, if high, are usually very sharp and narrow.

The shores are mostly high and precipitous. Narrow beaches, covered with large bowlders of rocks fallen down from the cliffs behind, extend with many interruptions around the island, but the latter are so numerous as to make traveling along the beach for any distance impracticable. Cliffs and pinnacles, formed into most fantastic shapes by the action of the waves, rise out of the sea all around the island, sometimes singly, sometimes in clusters. Occasionally, large detached or half-detached rocks form more conspicuous landmarks, as, for instance, the Bobrovi Kameni mentioned above, the *Sivutchi Kamen* at the northern entrance to Bobrovaya Bay, and the one of the same name on the other side only a short distance east from the main village, the *Cape Matreya*, *Gladkorski Kamen*, both on the east side, and most striking of all, perhaps, *Karabelni Stolp* at the rookery.

Outlying concealed rocks are few, except at the northwestern and southeastern capes, where dangerous reefs extend some distance into the sea. Otherwise the water around the island is bold, the farthest rock, to my knowledge, being off *Lebiazhi Mys*, is less than a mile from shore.

The rivers or brooks are necessarily all short and insignificant, hardly any one of them deserving special notice. A few of them, near their mouths, empty into small lakes, which have undoubtedly been formed by the sea throwing up material, thus damming off the inner end of the bay. Such lakes are *Pestshanoye*, just west of the main village; the lake at the end of *Zhirovaya Bukhta*, to the east of it; and *Gladkorskoye Ozero*, in the next valley beyond. The latter is not properly a lake, as the water is strongly brackish, the sea going in at high tide. There are many waterfalls, but on account of the insignificance of the streams, they are of little effect. A few, however, are quite picturesque; for instance, the one at Karabelni rookery, figured on plate 45.

The entire western coast is very steep, with but few shallow indentations. On the eastern side the valleys are wider and deeper, and open into more or less deeply cut bays, none of which, however, offer sheltered anchorage for vessels much larger than a boat, and as the waves of the Pacific Ocean roll unchecked against the rocks and beaches, landing is often difficult or impossible even at the villages. Only the little rounded cove forming the harbor at the main village is an exception, it being well protected in almost all weather by a cluster of rocks off the entrance. But even this place is not always safe, as demonstrated by the fact that a tide-gauge, solidly built of timber in the most sheltered part of the cove and loaded with rocks, was thrown high on the beach by the surf during the winter of 1882–83.

The main village, called *Preobrazhenskoye*, or the "village of the Transfiguration," because of its church being thus consecrated (pl. 33), is situated on the eastern, or here more appropriately northern, side near the northwestern extremity of the island. Its neat, red-painted frame houses and the handsome Greek church nestle cosily at the foot of a steep, high mountain, and it looks as if it might be a sheltered and pleasant place, but as a matter of fact it is not. The peculiar shape of the narrow valley at the mouth of which it is located compresses the winds and sends them howling down or up the cleft, while the precipitous walls, nearly 2,000 feet high on the east and south, shut out what little sunshine the island can boast.

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[1] July 23, 1883, 1,921 feet; July 20, 1895, 1,929 feet.

Here the natives live all the year round, except during the sealing season, when the village is almost deserted. The company has here its stores and dwelling house for the resident agent. The Government has a large building (the office and dwelling of the assistant administrator), a drug store, and a large schoolhouse. The house in which the priest and his family live lies farther off, and is not distinguishable from the larger houses of some of the natives. The new church, which was built in 1895, at a cost of 9,000, is quite an attractive building, though entirely too large for the community.

The two "summer" villages in which the natives spend the few months of the sealing season are located on the east side, opposite the corresponding rookeries. The first one from the main village is *Karabelni*, openly situated among the low sand dunes (pl. 34*a*). All the houses of the natives are small and poorly built huts, many of them being yurts or mud huts. The salt house and the Government's house are the most imposing structures. Occasionally some of the families stay here until Christmas, or even the whole winter, but the Aleuts are too social a people to stand for any length of time such isolation for the sake of thrift or economy. The southern village is *Glinka*, picturesquely built on the slope of the steep coast escarpment (pls. 34*b* and 35); otherwise its general features are like those of Karabelni.

SEAL ROOKERIES.

The character of the Copper Island seal rookeries, owing to the precipitous nature of its coast and the narrowness of its beaches,[1] is very different from those on Bering Island. There is one quite notable similarity, however, viz, that none are situated on the eastern shore of the islands, in spite of the fact that this side offers plenty of reefy and rocky places which might apparently answer all requirements. There are no records, to my knowledge, which would indicate that seals ever hauled up on the eastern beaches, and there is no reason to believe that they did.

There are two distinct rookeries on the west side of Copper Island, or, possibly we should say, groups of rookeries. However, while at the present day the various hauling or breeding grounds of each group are distinct and separate enough, they are manifestly only sections of the larger assemblage and are therefore most naturally and conveniently treated as such. These two main rookeries, named Karabelni and Glinka, corresponding to the summer villages of the same name situated opposite, on the east shore, are located in the southeastern half of the island, about $4\frac{1}{2}$ miles apart.

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[1] So steep are the rocky walls behind the Copper Island rookeries and so close do the seals lie to them that falling masses of earth and rocks have occasionally caused the death of many of the animals. Thus it is recorded (Otchet Ross. Amerik. Komp. za 1849, p. 23) that on the 16th of October, 1849, during an earthquake, a rocky wall fell down, burying a rookery on Copper Island. Another earth slide on one of the Glinka rookeries in 1893 similarly resulted in the killing of many seals.

KARABELNOYE ROOKERY. (Plate 90).

The northernmost of the two main rookeries is Karabelni (*Karabelnoye lezhbishtche*) located south of the village of like name and easily recognized by a very characteristic isolated rock, *Karabelni Stolp*, which rises a hundred feet perpendicularly out of the water at the western extremity of the rookery (pl. 38).

The "Stolp" is connected with the main beach by a low, flat, gravelly neck, the western portion of which is rocky and covered with waterworn bowlders.

The main coast itself is formed by a series of nearly perpendicular bluffs, the rocky sides of which rise above a narrow beach from 200 to 300 feet, and the only way to observe this rookery is from some exposed points on the top of these bluffs. From their projecting angles, in most cases, long rocky reefs run out into the sea, between which small coves with a narrow gravelly beach offer shelter for the breeding seals and their young. The bays thus included commence at a projecting bluff, between which and the sea there is no passage at high water, situated just west of the "Stolp," the first one between these two points being called *Martishina Bukhta*. Next, on the east side of the "Stolp," comes *Bolshaya Bukhta*, as the name indicates, the largest of these bays, followed by three small ones, viz, *Staritchkovaya*, *Dalnaya*, and *Nerpitcha*. In Bolshaya Bukhta the hauling ground is mostly coarse gravel with waterworn stones, up to the size of a fist, strewn over the surface and here and there with large bowlders which have fallen down from the overhanging cliffs. The grounds of the bays to the eastward, on the other hand, are stony reefs of the stratified rock of which Copper Island is mainly built up.

Nerpitcha Bukhta is easily recognized by a graceful waterfall, which overleaps the bluff in a fall more than 200 feet high. It must not be confounded with another waterfall, yet to be described, which forms the characteristic feature of the hauling ground specifically named Vodopad.

Beyond Nerpitcha the bluffs again rise so abruptly as to allow no passage along the beach beneath them; hence the name of this projecting bluff—*Nepropusk*. Between this point and the next a long rocky reef represents the beach; but the bluffs become gradually lower toward the middle, where a little creek has cut a V-shaped valley and falls over the comparatively low escarpment in a beautiful cascade 65 feet high (pl. 45). From this waterfall the part of the beach between these points is named *Vodopad*, and the cape terminating it to the east *Vodopadski Mys*.

This Vodopadski Cape, with its outlying rocks, is the extreme southern point on this part of the coast. It is the promontory seen farthest to the southeast from all points of the coast to the north of it and farthest to the northwest from all points south of it, although it projects but very slightly beyond a line through the westernmost of these points.

From Vodopadski Mys the coast trends a little northward again, being similar in character, viz, a narrow reefy and rocky beach at the foot of the steep bluffs. It is followed by a slight indentation, from which the ascent is so steep and difficult that it has received the name *Krepkaya Pad* (the hard valley). It is followed farther east by another, *Nepropusk*. Beyond this, a narrow strip of beach is called *Malinka Bukhta*, the "bay" being chiefly due to the projecting reefs at both ends. It is the last beach upon which seals have *regularly* hauled up at Karabelni, and is called the "little bay," in contradistinction to the large bay immediately to the east, which is often called

Bolshaya Bukhta instead of *Serodka*—a practice to be discouraged, as it gives rise to confusion with the hauling ground adjoining the Stolp.

A glance at the accompanying map (pl. 99) and the photographs of this rookery (pls. 38 to 40) will show how exceedingly difficult the taking of the skins must be. The bachelors are chiefly driven from the hauling grounds at Karabelni Stolp, Vodopad, and formerly Krepkaya Pad and Malinka Bukhta.

From the Stolp the seals are driven northward along the beach of Martishina Bukhta beyond the promontory, which can only be passed at low water, on to the beach of the rather wide and gently curving *Stolbovaya Bukhta*. If the number of seals is so insignificant that the skins can be easily carried on the back and the meat is not wanted in Karabelni village, then they are driven across the little rivulet which here runs into the sea and are killed on the beach just west of it. The carcasses are left at the water's edge for the waves to carry off.

The *driveway* to Karabelni over the mountains is a long and very hard one, being fully 2½ miles long.

In order to facilitate the ascent up the coast escarpment a *stairway* has been built of driftwood logs resting on pegs driven into the ground, as shown in the accompanying photograph (pl. 49*b*). The upper end of these stairs (68 feet above the sea) enters the little creek mentioned above and the driveway proceeds up the narrow valley. The kettle-shaped upper end of the valley, the sides of which form a slope of about 40 degrees, is separated from a similar kettle on the north side by a narrow saddle. This pass I have determined to be 643 feet.[1] The descent is steep, but not so high as on the south side, and the driveway now follows the bed of the little creek, as the narrow V-shaped valley affords no other road. The lower end of the drive, after it enters the grass-covered sandy plain back of the Karabelni village, where the killing grounds are situated, is comparatively easy.

The *salt house* was formerly situated at the front of the village, east of the river and of the large rock in the bay called *Urili Kamen*. The beach there is not very safe or convenient for loading the skins into the boats or landing the salt, for which reason a new one has been built at *Popofski*, the small "bay" just west of Urili Kamen (pl. 63*a*).

From Vodopad the driveway, if it is deemed necessary to take the meat to the village, is longer by at least a mile over the high plateau northeast of the rookery, besides being very severe in other respects. The grassy slopes of the valley opening at this point are very slippery and steep (about 30°), but the greatest hardship is caused by the exceedingly difficult ascent of the bluff before reaching the valley. The bluff here consists of the naked hard rock, and consequently steps built of driftwood logs, as at Stolbovaya Bukhta, were out of the question. They had to be roughly cut out of the rock itself, as shown in the accompanying photograph (pl. 45), which will give a better idea of this extraordinary place than any description. It will be seen that the side next to the picturesque waterfall is nearly perpendicular, in fact so steep that the men can not follow the drive up on that side in order to urge the seals on and to prevent them from going down over the precipice. To remedy this a rope is stretched from the top down to the beach, as is plainly shown in the photograph to the right of the fall. When seals are driven, rags and scraps of paper are fastened to this rope, which is kept in constant motion so as to frighten them and urge them on.

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[1] Average of 6 observations on July 3 to 8, 1883.

It is hardly to be wondered at that the men prefer to let the seals carry their own skins up this road. The top of these stairs is 65 feet above the sea, and I found it pretty hard work to climb it without carrying anything.

At Krepkaya Pad and at Malinka Bukhta there is no possibility of getting the seals up alive; hence they were killed back from the beach and their skins carried across the mountains. At Krepkaya Pad the men alone did the killing and carrying, while Malinka Bukhta was reserved for the women, who did all the skinning and carried the skins to the salt house. Malinka Bukhta is reached along the beach from Serodka, but between it and Krepkaya Pad there is a *Nepropusk* which can not be passed.

The appended map of Karabelnoye rookery (pl. 99) was made in 1883, July 3 to 10. The angles were taken with an azimuth compass and the distance measured with pediometer. In 1895 my stay at the rookery was too short to make an independent plane-table survey, but a blue print of the old sketch was placed on the table and a few necessary corrections made. A series of photographs taken at the time have also been used in verifying it.

GLINKA ROOKERIES. (Plate 101.)

The southern, or Glinka, group of rookeries (*Glinkovskoye lezhbishtche*) is situated about 4¼ miles southeast of Karabelnoye. They contain the most important hauling grounds on the island, but at the same time the most inaccessible. The island is here very narrow, yet the mountains average even a greater height than farther north, and the passes between the short and steep valleys on the east and west sides are also very high. The mountains rise precipitously from the sea, bordered only by a very narrow beach of rocks and stones, hardly deserving the name. All the rocks are here stratified, with a very pronounced dip. The projecting capes run out into jagged reefs formed by the exposed broken strata standing nearly on end, while numerous outlying rocks and stones guard the approaches (pl. 47). Singularly formed rocks and pinnacles carved out by the never-ceasing breakers and sawtooth promontories mark the ends of the various bays.

The length of the whole beach of this rookery is about 6 miles, but this stretch is not occupied by a continuous line of seals. On the contrary, they are gathered in groups at certain points, which, for some reason unknown to us, are preferred to others, although apparently equally suitable. These various seal grounds are named as follows from west to east: Gorelaya, Lebiazhi Mys, Peresheyek, Urili Kamen, Pestshanoye, Pestshani Mys, Pagani, Zapadni, Sabatcha Dira, Palata, Zapalata, Sikatchinskaya, Gavarushkaya, and Babinskaya Pad.

Of these, Palata (*Palatinskoye lezhbishtche*) is unquestionably the most important. It is named from the high and sharp promontory which extends farthest out into the sea on this part of the coast, and which somewhat resembles a large house with a steep, peaked roof. The top of it is fully 500 feet above the sea, and the walls are very steep, being in fact nearly perpendicular on the south side. This is *Palata* proper. A very jagged reef extends in a southwesterly direction from the foot of it (pl. 70), and to the northwest are several detached rocks. From one of these two of the accompanying photographs were taken (pls. 48 and 49). On the north side this promontory is separated from the high mountain walls back of it by a narrow gully, which toward the sea expands into a somewhat open basin, the bottom and sides of which are lined with a pale-buff clay. The beach, a narrow strip covered with large rounded pebbles, extends northward under the clayey banks for several hundred yards, and continues in the same manner under the precipices of one of the higher mountains of this part of the island, rising to 1,400 feet. No particular feature, except a pile of rocks somewhat larger than usual, distinguishes this part of the beach, which is named *Sabatcha Dira*, the "the dog hole."[1]

From here to Pestshani Mys the character of the coast and beach is the same, except that about halfway the overhanging cliffs crowd the beach still more closely, with a small reef at their feet, thus forming a "mys," or cape, *Zapadni Mys*, probably so called because it is situated nearly due west from Glinka village. The gently curving beach between Zapadni and Pestshani Mys is called *Pagani*, the Unclean, for no obvious reason. At this place there is a break in the mountain wall behind, for above the coast escarpment a comparatively wide valley opens up, the drainage from which empties out at Pagani in three distinct streams.

The accompanying photographs (pls. 46, 54*a*) show the character of this beach better than any description.

Pagani terminates at the northern end with *Pestshani Mys*. This is an exceedingly jagged cape of the saw-tooth type, the strata of the rock being nearly vertical and with an outlying detached rock, preventing further passage along the beach. The name, meaning Sandy Cape, has no reference to any characteristic feature of it, but is due to the fact that it forms the eastern termination of *Pestshanaya Bukhta*,[2] Sandy Bay, which extends from this cape northwestward. The western termination of this bay is marked by a slight projection of the beach and a low stony reef, which forms the great *Pestshani hauling ground*. A comparatively large stream empties into the bay at its inner end, draining a grass-clad valley of considerable size compared with most other valleys in this part of the island, and the coast escarpment is unusually low.

Beyond this hauling ground the cliffs again approach the sea, and the slightly curved narrow beach, covered with water-worn stones and loose rocks, turns outward in order to pass a slight but very jagged projection of the cliffs, in front of which a low isolated rock on the beach and another in the water beyond the low reef form another attraction for the seals. The rock on the beach, called *Urili Kamen*,[3] Shag Rock, gives this part of the rookery its name (pl. 54*b*).

The beach from here to the next cape is narrow and rough, covered with water-worn loose rocks from the foot of the steep slope at the back into the sea. This cape terminates in a large, semidetached, roof-shaped, grass-clad rock, which obstructs the passage along the beach. A low but knife-sharp ridge connects it with the cliffs behind; hence the name of the place *Peresheyek*, or Isthmus, and that of the rock *Peresheyekski Kamen*.

From this point the last cape seen to the west is *Lebiazhi Mys*, which is easily recognized by a pair of cone-shaped twin rocks rising from the extreme end of the reef and several single ones of similar shape nearer the cape, as well as by two detached dangerous rocks situated seaward in the direction of the reef, the outer one fully a third of a mile from the cape. The bay between Peresheyek and this cape is called *Lebiazhaya Bukhta*, Swan Bay; hence the name of the cape. The beach is rocky and stony.

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[1] There are a number of places on Copper Island called Sabatcha Dira, but they are in all other cases actual holes through the rocks. I have been unable to see the application of the name to that part of the Palata rookery now so designated. Formerly there may have been such a perforated rock, now crumbled to pieces.

[2] There are at least four different Pestshanaya Bukhta on Copper Island, a source of great confusion.

[3] Urili Kamen is a common name for various isolated rocks on Copper Island; for instance, at the West Cape of Glinka Bay and in the bay off Karabelni village.

On the other side of Lebiazhi Mys the coast trends more northerly and is visible all the way to Vodopadski Mys, Karabelnoye rookery. But we are here only concerned with the bay immediately behind Lebiazhi, as it is the last seal ground at this end of the rookery. The character of the beach differs not from the seal ground preceding it. Its name is *Gorelaya Bukhta*.

Returning to Palata we notice that from the extreme point of Palatinski Mys the coast trends more easterly. The abrupt walls of the cliffs are even more precipitous, and the beach, utterly inaccessible from the land side, is fringed by wide reefs surmounted by tall isolated rocks assuming the most fantastic shapes as pillars, pinnacles, towers, etc. Projecting corners hem in snug little coves for the breeding seals, while the outlying rocks and reefs break the force of the angry ocean and afford shelter in quiet pools for the growing pups.

The first of these coves, as the name *Zapalata* (behind Palata) indicates, is situated immediately under the perpendicular southern wall of Palata itself, and guarded on the east side by the pillar-shaped *Stolbi*. The beach itself is narrow, but smoothly covered with small stones rounded and polished by the water and of a very light pearl-gray color. This is possibly the most important of the breeding grounds, and is accordingly named by Colonel Voloshinof "Glavnoye-Glinkovskoye Lezhbishtche" (Glinka main rookery). The name Zapalata, employed by the natives, however, is much preferable, not only because in common use, but also on account of its brevity and euphony (pls. 55, 56).

Sikatchinskaya follows on the other side of the "Stolbi" (pl. 57*b*), possessing the same main characteristics as Zapalata, merging eastward into *Gavarushkaya Bukhta* (pl. 76).

The end of the latter, or rather the beginning of the next bay, is marked off by a solitary, conical rock rising up in the middle of the reef. It is called *Babin*, and hence the name of the beach beyond, *Babinskaya Bukhta*, and the valley opening at this place several hundred feet above the beach, Bakinskaya Pad. The beach is covered with the same water-polished, light-gray stones. This bay at its eastern end is blocked by a very rocky and rough reef, for which the natives only have an Aleut name *Kulomakh*. This is the eastern end of the Glinka seal rookeries. (Pl. 12.)

The main *killing grounds* at this rookery are situated on the eastern side of the island, where the village and the salt houses are located (pl. 78). Only of late years, when many drives have been so small that there were people (men, women, and children), enough to carry the skins on their backs across the mountains, and the meat was not wanted in the village for food, has it been the custom to kill the seals on the west side.

I have already remarked that the hauling grounds east of Palata are utterly inaccessible from the land side. Formerly, when seals were plentiful, the bachelors used to haul up in great numbers on some of these beaches, notably at Babinski, and if the company's steamer, *Aleksander II*, happened to be at the island at a time when the weather and the waves on the west side of the island allowed boats to land there it was customary for the steamer to take the people around the Southeast Cape and land them at those hauling grounds. The seals were slaughtered and skinned on the beach, while the pelts were taken on board the steamer and salted in the hull.

On the photograph representing Palata rookery (pl. 50) a small patch of numerous white dots will be observed on the grass-clad hills near the extreme right of the picture. These white dots are sea gulls feasting on the carcasses of a small drive of seals killed here. It will be seen that this drive was neither long nor could it have been particularly severe, considering that it is on Copper Island. A glance at the photograph of the driveway (pl. 79) shows that the seals have to climb a considerable incline into the sod of which steps had to be cut to give the animals a foothold, but with the above proviso it involves comparatively little hardship on the seals. Not so the regular driveway from this rookery to the killing grounds at Glinka village, a distance of nearly 2 miles over a ridge more than 1,200 feet high. The slopes to be climbed, or slid down, are in places 35° to 40°. They are partly grass-clad, and then very slippery.

From Zapadni and Sabatcha Dira the driveway is somewhat shorter and the pass over the mountains lower, *only* about 835 feet, but the ascent is exceeding rough. The lower part follows the bottom of a narrow V-shaped valley—or rather gully—the bed of a short torrent filled with large bowlders, over which the seals have to struggle hard (pls. 13 and 58*a*). Higher up the slope becomes steeper and at the same time covered with a tenacious clay, hence very slippery. Steps have been cut in the ground to facilitate the ascent, but the clayey soil is soon smoothed down and made as slippery as before.

From Pagani the distance is about the same and the pass to be scaled slightly lower (780 feet), but the ascent is not quite so steep nor nearly so rough, and the drive from this hauling ground may be characterized as the least severe at this end of the island.

The seals hauling up west of Pestshani Mys used to have the longest of all the driveways on the island and one of the most severe as well. After being driven along the beach for some distance they entered the Pestshani Valley, where the river has cut down the coast embankment, and then had to climb the first ridge on the east side. If the drive was a large one—and in former days drives of 4,000 seals were not rare[1]—it took too long a time to ascend only in one place, so that one portion was driven over the ridge where it was only about 670 feet high, while the other had to climb at least 900 feet. On the other side of this ridge was a descent into Pagani Valley, then another hill was ascended, and finally a third ridge, 780 feet above the sea, had to be climbed before the final descent into the Glinka Valley took place. The length of this drive was about 2½ miles, and in warm weather it sometimes took two days to finish it.

This was finally found to be too great a waste of time and energy, and as more salt-house room was required it was decided to drive the seals the shortest way across the island, and as there was a good anchorage and a tolerably decent beach for landing boats, to build a new salt house there. This is now known as the *Pestshani salt house* (pl. 58*c*).

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[1] In 1887 as many as 6,000 seals were taken in one drive at this place, according to Dr. Slunin.

This change has shortened the drive from the rookeries west of Pestshani Mys from 2½ to 1½ miles. In addition, there is now only one pass to climb, which my aneroid showed to be about 740 feet above the sea. The ascent is not very steep nor is the road particularly rough, but the final descent to the salt house is simply a "slide." On the whole, it is now the easiest of the long drives at Glinka. This, of course, does not mean that the drive is an easy one, and only a fraction of all the seals driven (in 1895 about one sixth) gets the benefit from it.

The killing grounds are located on the grassy slope near the beach, just north of the Pestshani salt house. The killing grounds at the Glinka village used to be beyond the houses, but are now moved to near the beach, a few hundred yards north of the village. In the latter there are two *salt houses* close together. One of these has had an addition built to it, so that it is now twice its original capacity (pls. 35, 36).

The map of the Glinka rookeries (pl. 101) is the result of a traverse plane table survey made during the few intervals from August 4 to 11, 1895, in which the rookeries were free from fog or rain. It was very difficult to find a level locality long enough for a suitable base line. After the map was completed, however, I measured off a line 1,000 feet long on the beach in front of the village and sighted it in on the map.

I had with me a sketch map which I had drawn from sketches and angles obtained in 1883. It was found fairly accurate, especially considering the fact that the fog during my visit in 1883 was so perverse that I never obtained a simultaneous sight of both sides of the island.

2.—ROBBEN ISLAND.

DESCRIPTION.

Robben[1] Island, the literal German or probably rather Dutch[2] equivalent of its Russian name, *Tiuleni Ostrof*, meaning seal island, is situated in the Okhotsk Sea, 11 miles southwest from Cape Patience (*Mys Terpenia*), the end of the curiously long and narrow peninsula on the eastern shore of Saghalin Island. The position is now given as 48° 31′ 30″ north latitude and 144° 43′ 48″ east longitude, as determined by Capt. John G. Blair.[3]

The following description is based upon the account given in the former edition of this work, with such additions and corrections as I was able to make during my visit in 1896. The accompanying maps (pl. 93) are copied, with modifications and corrections, from recent plans issued by the Russian hydrographic office.

The island is really hardly more than a large, flat-topped rock, trending northeast by southwest, long and narrow. The entire length in that direction is about 1,900 feet, while the elevated portion, which rises abruptly to between 40 and 50 feet and tapers off to a point at both ends, measures only 1,200 feet in length. The width of this portion hardly exceeds 120 feet, while the beach, consisting of coarse sand and pebbles, which surrounds it varies between 30 and 120 feet.[1]

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[1] Not Robbin Island or Robin Island, as it is occasionally written.

[2] The name Robben Island was probably first used by sealers—or whalers—who had learned their trade in the southern hemisphere (cf. Robben Island, at the Cape of Good Hope, off False Bay), in which case the Russian name is more likely to be the translation than vice versa.

[3] Lieutenant Kolubakin, I. R. N., in charge of the island, 1896, informed me that his observations corroborate the position given by Blair.

A rocky reef extends to the northwest, terminated by a large rock, the *Sivutchi Kamen*, or Sea-lion Rock, about 10 feet high, a favorite resort of sea lions. A similar reef, but without projecting rocks, marks the southeastern end of the island.

There is no harbor or convenient anchorage, and in bad weather vessels have to seek shelter under Saghalin. Captain Sandman's manuscript map indicates "anchorage anywhere to northwest of island in from 10 to 20 fathoms; 13 fathoms, sandy bottom, 1 mile off, center of island SE. ½ E.; end of South Reef S. by E. ½ E.; end of North Reef and rock ENE. Nearer in rocky bottom." The *Albatross* anchored in 9½ fathoms of water about seven-eighths of a mile off, center of island about SE.

On the west side of the island, toward the southwestern end, there is a slight cut in the rock, barely leaving room for the government houses, which contain the quarters for the officers and men of the naval guard, as well as their bath and storehouses (pls. 1, 2). A dilapidated frame shanty farther south, on the beach at the base of the rock, serves as lodging for the Aleut workmen (from Bering Island), and a little farther beyond is the company's still more ramshackle salt house, which has to be propped up with sticks to prevent it from falling down (pl. 3).

The government houses (pls. 1, 2) are substantial and comfortable frame houses, painted a red brown with white trimmings. The officers' quarters consist of an entry hall and two rooms about 12 by 12 feet. The men's house also consists of two rooms—one sleeping room with bunks, and one eating and gun room which also serves as a kitchen.

There is no fresh water on the island. For this commodity the temporary residents depend upon rain water, which is collected in large iron tanks, and upon a small condenser.

The rock consists of layers of a coarser conglomerate and a finer-grained sandstone-like rock, all thoroughly weathered and crumbling. The top of the rocky portion (pl. 4) is nearly flat, the sides in many places perpendicular or even overhanging.

The vegetation is very scant. There is a small grassy area, consisting of *Elymus*, at the base of the south end of the rock, as indicated on the map, and a couple of much smaller patches at the northeast point on the eastern side. I only saw 8 species of higher plants (August 29 and 31) as follows:[2]

PLANTS OF ROBBEN ISLAND.

1. *Barbarea* (?) A single specimen in no condition to be identified. I looked in vain for another.
2. *Arenaria peploides.*
3. *Senecio pseudo-arnica.*
4. *Trientalis europaea* (L. Stejneger Coll. No. 73).
5. *Mertensia maritima.*
6. *Atroplex littoralis?* (L. Stejneger Coll. No. 77).
7. *Poa annua* (L. Stejneger Coll. No. 75).
8. *Elymus mollis.*

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[1] These figures are taken from Shamof's map (pl. 93). Lieutenant Egerman, I. R. N., gives the following dimensions: Length, 1,960 feet; width, about 300 feet; height, 48 feet (Morskoi Sbornik, 1884, No 11, Lots. Zam., p. 8). Capt. J. G. Blair says: "1,960 feet long by 175 feet wide, and in places 46 feet high" (Fur-Seal Arb., III, p. 194).

[2] The species of which I brought home specimens have been kindly identified by Dr. J. N. Rose, Assistant Curator, Division of Botany, U. S. Nat. Mus., and by Professor Lamson-Scribner.

The animals are equally few. Sea lions (*Eumetopias stelleri*) were formerly numerous, but have decreased with the fur seals. Even the birds are represented by only a few breeding species. On August 29 and 31, 1896, I saw only the following:

BIRDS ON ROBBEN ISLAND.

1. *Uria lomvia arra.*
2. *Larus schistisagus.*
3. *Rissa tridactyla pollicaris.*
4. *Arenaria interpres.*
5. *Ægialitis mongola.*
6. *Actodromas ruficollis.*
7. *Limosa lapponica baueri.*
8. *Heteractitis brevipes.*
9. *Phalaropus lobatus.*
10. *Histrionicus histrionicus.*
11. *Phalacrocorax sp.*

Of invertebrate land animals I discovered only very few, in spite of a careful search, viz, a myriapod (*Lithobius*) and two beetles. Mr. M. L. Linnell examined them later, and informed me that one is a species of *Bembidium*, possibly new, though he did not venture to describe it until it can be compared with the numerous species from the mainland, which is impracticable at present. The other species belongs to the highly interesting genus *Ægialites*, of which hitherto only two species were known, both from the Pacific coast of North America. The Robben Island species the late Mr. Linnell described as new, under the name *Ægialites stejnegeri*. (Canad. Entomol., XXX, 1898, p. 74.)

The climate is naturally more "continental" in its character than on either the Commander Islands or Pribilof Islands, having colder winters and warmer summers, but I am not aware that any regular observations have been published for the island. Mr. C. Carpmael, director of the meteorological service of Canada, has furnished a few figures, but they are apparently only based upon curves in the *Challenger* report and are mere approximations. He states (Fur Seal Arb., VIII, p. 511) that according to these the mean temperature for May would be about 42 degrees, but thinks possibly the mean might be as low as 40 degrees. In June it is "probably about 48 degrees." In July "probably a little under 60 degrees." In August "it must be nearly 60 degrees." In September "it must be a little below 55 degrees." In October "about 44 degrees."[1]

I am under great obligations to Capt. E. Egerman, commanding the I. R. V. F. S. *Khabarovsk*, for a complete transcript of the meteorologic observations made by Lieutenant Kolubakin at Robben Island during July, August, and part of September, 1896. Only the means are given here, which have all been computed by myself. Dates have been changed to new style and degrees of centigrade converted to Fahrenheit. The percentage of relative humidity is also computed by me.

ABSTRACT OF METEOROLOGIC OBSERVATIONS MADE BY LIEUTENANT KOLUBAKIN, I. R. N., AT ROBBEN ISLAND, OKHOTSK SEA, FROM JULY 2 TO SEPTEMBER 14, 1896 (NEW STYLE).

The observations were made at 8 a. m., 12 noon, 4 p. m., and 8 p. m., local time. Only the daily means are given here, obtained by adding together these observations and dividing by 4.

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[1] According to Shamof (Ausland, 1885, p. 537) the mean temperature at Cape Patience, Saghalin, was 52.2° F. for June, and 62.4° F. for July, 1884.

The barometric readings are those of an uncorrected aneroid. Instrumental error unknown. Elevation of aneroid about 30 feet above sea level.

The thermometers (centigrade, but here converted to scale of Fahrenheit) were hung in a small perforated wooden box on the *south* side of the officers' house. In view of the generally overcast sky this circumstance may not have affected the temperature record to any great extent.

The percentage of cloudiness was obtained from the eye estimates of the observer, recorded on a scale of 0 to 10 at each observation. The mean of the four daily observations was used as the mean for the day; 100 per cent represents sky completely overcast.

The percentage of relative humidity was obtained from the difference between the dry and wet bulb thermometers.

"Drizzle" is not recorded as rain.

Direction of wind is by compass.

The maximum force of wind here given is the maximum force at the time of the four daily observations. It was obtained from the estimates of the observer, recorded on a scale of 0 to 10, 0 representing calm and 10 hurricane.

JULY, 1896.

Date.	Barometer.	Temperature.	Cloudiness expressed in percentages.	Percentage of relative humidity.	Rain.	Fog.	Direction of wind.	Maximum force of wind 0-10.
	Inches.	°*F.*						
2	30.08	53.4	48	75	......	......	NE.	3
3	30.11	57.6	68	73	......	......	NE., N., NW.	3
4	30.01	60 1	28	74	......	......	W., SW., NW.	2
5	30	61.9	10	70	......	×	NE.	1
6	29.97	57.6	50	69	......	×	NE., E., SE.	3
7	29.97	55	100	81	......	×	SE.	2
8	29.97	51.1	100	81	......	×	SE., E.	3
9	29.94	54.1	100	80	......	×	NE., E.	3
10	29.98	59.4	80	66	......	......	E., SE.	2
11	29.99	52.2	100	75	......	×	SE.	4
12	29.92	58.8	70	69	......	......	SW.	4
13	20.96	63.7	90	68	......	×	SE.	2
14	29.93	57.4	100	85	......	×	SE.	3
15	29.84	50.7	100	95	×	×	NE.	4
16	29.94	59.7	45	78	......	......	NW., W.	2
17	30.08	58.6	72	80	......	......	SW.	3
18	29.97	60.3	100	83	......	......	S., SW.	2
19	29.94	56.5	100	89	......	×	SE.	2
20	29.89	58.1	100	91	......	×	SE., S., SW.	2
21	29.85	58.5	95	83	......	×	SE., E., NE., N.	3
22	30	57.9	82	88	......	×	SE.	2
23	29.96	58.8	70	77	......	......	SW., W., N.	5
24	30.08	63.3	20	64	......	......	N.	3
25	29.93	59.7	100	81	......	×	SW., W., N.	2
26	29.89	50.7	100	86	......	......	N.	5
27	29.94	62.4	35	62	......	......	N.	3
28	29.94	56.8	80	80	......	×	SE.	2
29	29.90	54.3	100	82	......	×	SE.	6
30	29.76	53.6	100	89	×	×	SE.	4
31	29.74	53.2	100	88	......	×	SE., N.	2
Means	29.95	57.2	78	78.7				

Number of clear days, 3; of fair days, 8; of cloudy days 19
Number of days on which rain fell 2
Number of days on which fog was observed 18
Prevailing direction of wind .... SE.
Maximum force of wind at time of observations 6

AUGUST, 1896.

Date.	Barometer.	Temperature.	Cloudiness expressed in percentages.	Percentage of relative humidity.	Rain.	Fog.	Direction of wind.	Maximum force of wind 0-10.
	Inches.	°*F.*						
1	29.72	51.8	100	90	×	......	N., NW.	2
2	29.70	55.4	85	82	......	×	SW.	5
3	29.70	58.3	45	78	......	......	W., SW.	6
4	29.79	55.8	100	86	×	......	NE.	3
5	29.98	58.3	100	82	......	......	N., NE., E.	2
6	29.98	52.7	100	92	×	......	SE.	4
7	29.69	57.2	100	95	×	......	SE.	6
8	29.85	57.4	100	91	......	×	SW., S.	3
9	30.08	59	75	89	......	×	SE.	2
10	30.13	59.7	85	85	......	......	SW., S.	2
11	30.07	57.9	100	90	×	×	SE.	2
12	30.02	60.8	90	91	......	×	SW.	2
13	30.08	58.6	100	92	......	×	NE.	2
14	29.96	56.5	100	95	×	......	SE.	3
15	29.89	59.9	100	96	×	×	0., NE.	2
16	29.76	58.8	90	92	×	......	SW., S.	4
17	30.13	64.2	32	77	......	......	SE.	2
18	30.24	61.7	100	83	......	......	0.	0
19	30.24	59.4	100	66	×	......	E.	6
20	30.[illegible]8	59	90	91	......	×	NE., 0.	1
21	30.18	57.6	100	94	......	×	SE., E.	2
22	30.18	58.3	100	91	......	×	NE., E., SE.	2
23	30.23	57	100	92	×	......	SE.	3
24	30.33	60.4	90	81	......	......	NE.	4
25	30.44	63.7	5	82	......	......	SE.	1
26	30	60.8	55	87	......	......	SE.	3
27	30.32	61.3	30	85	......	......	SE.	4
28	30.22	62.6	48	78	......	......	SE.	4
29	29.89	55.4	100	95	×	......	SE., E.	6
30	30.08	55.3	60	92	×	......	NW., N.	7
31	30.20	57.2	95	90	×	......	S., SE.	2
Means	30.04	58.5	83	87.4				

Number of clear days, 1; of fair days, 6; of cloudy days	24
Number of days on which rain fell	13
Number of days on which fog was observed	10
Prevailing direction of wind	SE.
Maximum force of wind at time of observations	7

SEPTEMBER, 1896.

Date.	Barometer.	Temperature.	Cloudiness expressed in percentages.	Percentage of relative humidity.	Rain.	Fog.	Direction of wind.	Maximum force of wind 0-10.
	Inches.	°*F.*						
1	29.97	50	100	96	×	......	SE., E.	6
2	30.07	54.3	45	86	......	......	N.	6
3	30.26	58.3	5	85	......	......	0.	0
4	30.36	57.9	75	74	......	......	S., SE.	2
5	30.16	52.5	100	88	×	......	SE.	7
6	29.87	55.8	100	95	......	×	SE., 0.	1
7	30.04	58.3	50	86	......	......	0, SE.	1
8	30.15	52.9	100	95	×	×	SE.	2
9	30.15	56.5	100	94	......	×	N., NE.	3
10	30.28	60.4	100	87	......	×	SE., 0, NE.	1
11	30.35	59.7	35	91	......	......	NE., 0.	2
12	30.34	54.3	90	89	......	......	NE.	4
13	30.30	54	100	92	×	......	NE.	3
14	30.30	61.3	10	81	......	......	N., NE.	1
Means	30.18	56.2	72	88.4				

The mean temperature of the surface of the water around Robben Island is given by Makarof as 13 degrees centigrade (middle of August).

These temperatures are considerably higher than the corresponding ones at the Commander Islands, and lend color to the statements by Captain Blair and Capt. G.

Niebaum, that the Robben Island seals can be distinguished by experts from those on the Commander Islands, and that they do not mingle with them, being a separate and distinct herd (Fur Seal Arb., III, pp. 193, 204). While in Japan last autumn I learned from Mr. E. J. King that the pelagic sealers distinguish the "inshore herd" of seals by the whitish under fur, which is attributed to the Robben Island and Kuril Islands seals as distinguished from the Commander Islands seals, in which the fur is more brownish.

Very little is known about the movements of the Robben Island seals, except that they migrate southward. I am informed by Capt. D. Grœnberg, however, that sealers who are said to have followed up the migrating herd assert that these seals pass through La Perouse Strait. This information was corroborated by answers to the inquiries I made in Hakodate. Mr. King told me that it is the opinion of the sealers that the Robben Island seals in fall travel down La Perouse Strait into the northern portion of the Sea of Japan. About Christmas a large proportion pass out through Tsugaru Strait, between Yezo and Hondo, the main island of Japan, into the Pacific, keeping inshore 10 to 15 miles along the east coast of northern Hondo. In spring the main body travel northward along the Pacific side of Yezo, while a smaller portion—chiefly younger seals—return by way of Tsugaru and La Perouse straits. The Japanese skipper of *Unohi Maru*, Mr. Matsuoko, and his purser, Mr. Nagai, expressed the same opinion and added that in going north in spring the seals of the "inshore herd" earlier in the season pass into Okhotsk Sea between the islands of Kunashiri and Iturup, but later between Iturup and Urup. The feeding-grounds of the Robben Island seals seem to be unknown.

The knowledge of the condition of the rookery is also highly fragmentary. When the first sealers arrived there they found the whole beach surrounding the island so occupied by seals that there was no place to effect a landing without driving the seals off. At present the few remaining seals congregate on the very narrow beach on the southeast side of the island[1] (pls. 5 to 9). The bachelors are now hauling up on both sides of the breeding females, and so close that many females are caught in the drives.

The various estimates of the number of seals on this island may be somewhat more accurate than similar figures from the other sea islands, because of the small extent of Robben Reef and the ease with which the rookery can be watched. Thus, in 1871, when Hutchinson, Kohl, Philippeus & Co. took possession of the place, Mr. Kluge found that "there were not over 2,000 seals to be found on the entire island." Capt. G. Niebaum, who visited it at the same time as the representative of the firm, states as follows: "The rookeries were also very small, and contained at that time, of all classes, about 800 seals, as I ascertained by a careful count, and, in addition, a small number in the waters adjacent."[2] The rookery was therefore in 1871 in about the same condition as I found it in 1896. Between these two years lies the whole rise and fall of the Robben Island fur-seal rookery.

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[1] The breeding-ground, in 1892, according to Dr. Slunin (Promysl. Bog. Kam. Sakh. Komand., p. 12), occupies about 4–5 sazhen by 70–100 sazhen (a sazhen being equal to 6 feet). In 1896 it had shriveled to about one half.

[2] Dr. Slunin (Promysl. Bog. Kam. Sakh. Komand., p. 13) has been able to utilize certain reports by some of the naval officers in charge, from which a few interesting facts are noted: "According to the reports of Lieutenants Rosset (1887) and Brumer (1892) the arrival of the first bulls depends upon whether the ice has disappeared along southern Saghalin or not; but whether there is any ice present in the Bay of Terpenia or at the mouth of the Taraika is apparently of no significance. Thus, in 1891,

In administrative respect Robben Island is under the jurisdiction of the administrator of the Commander Islands and is included in the lease of the latter. In fact, Robben Island is regarded as a dependency of Bering Island, as the men of the killing gang are taken from that island and the money for the Robben Island seals goes to the Bering Island natives. Since 1885 the government has stationed a force of 15 to 20 sailors and one or two officers of the navy on Robben Island, in order to protect it against the raiders, but apparently with but poor success, judging from the history to be related further on. This failure is partly due to the fact that on account of the severity of the season the guard has been taken off before the middle of October.

As remarked above, the island is included in the lease of the Commander Islands, and Hutchinson, Kohl, Philippeus & Co. took possession of it in 1871. The Robben Island part of the business was attended to chiefly by the schooner *Leon*, Capt. John G. Blair; mate, Mr. E. Kluge. The name of the schooner belonging to the new company is the *Bobrik*, 119 tons (pl. 59*b*), Capt. D. Grœnberg, master,[1] who for many years was first mate and late captain of the old company's steamer *Aleksander II* (pl. 59*a*). The skins have hitherto been shipped to London via San Francisco. During 1897 the schooner was laid up, and the natives brought to and from the island by the company's Okhotsk tea steamers, in which the skins were also brought to Petropaulski.

HISTORY OF ROBBEN ISLAND.

The history of this little reef is very interesting and highly instructive as showing how nearly impossible it is to extirpate the seals either by harsh measures on shore or by excessive raids from marauding vessels, provided there be some protection extended to them, however small.

The existence of seal rookeries on Robben Island was probably first discovered[2] by some of the numerous American whalers frequenting Okhotsk Sea in the early

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the bulls arrived very slowly; on June 5 (old style) there were in all 28 males, 65 females, and one pup; in 1892 the ice also remained late on northern Saghalin, and on May 15th (old style) there was not one seal on the rookery, the first bull arriving on the 16th of May (old style). In 1893 the first bulls appeared on May 17 (old style) at the coast, although broken ice was lying along the eastern side; the temperature of the water was 25° C. Ice was covering the deep water of Terpenia Bay. * * * In 1891, at the end of the period of birth, there were on July 3 (old style) 5,000 females and 4,000 pups, showing one-fifth of the females to be virgin. Lieutenant Brumer notes the following special circumstance: In July and the beginning of August (old style) there were about 15,000 to 17,000 seals, but in September the inhabitants of the rookery had increased considerably."

Dr. Slunin himself, in the beginning of May (old style), 1892, calculated the number of seals on Tiuleni to be from 13,000 to 16,000 all told, allowing 3 square feet to each animal, large and small (*op. cit.*, p. 17). Here seems to be some mistake. According to his own maximum figures of the extent of the rookery it covered only 18,000 square feet, which according to his way of calculating would only give 6,000 seals, large and small. In 1892 the first bulls arrived about May 16 (old style), and the first females May 20 (*op. cit.*, p. 27). This is contrary to what he states on p. 18, where it is said that in 1892 the bulls arrived about June 15–18 (old style), and the females came ashore on June 26.

[1] Now commanding the company's barkentine *Bering*.

[2] The existence of the island itself was known long before that, however. It is fairly well located on a map published by the quartermaster-general's department, St. Petersburg, 1802.

fifties. In a recent statement Capt. G. Niebaum alludes to these early visits as follows:

> From information gathered from various sources I learn that Robben Bank was first visited and exploited by whalers about 1852 or 1853, and that in two seasons they obtained some 50,000 or 60,000 skins, almost completely "cleaning it out." I understand that for several years thereafter the occasional vessel which touched there found the rookeries practically deserted. (Fur Seal Arb., III, p. 203.)

Captain Scammon (Marine Mammalia, pp. 150-152) gives an account of a visit of a New London bark to Robben Island in 1854 or 1855, which it may be well to reproduce here:

> In the midst of the Crimean war an enterprising firm in New London, Conn., fitted out a clipper bark, which was officered and manned expressly for a sealing voyage in the Okhotsk Sea. The captain was a veteran in the business, and many thought him too old to command, but the result of the voyage proved him equal to the task. The vessel proceeded to Robben Island, a mere volcanic rock, situated on the eastern side of the large island of Saghalien. Many outlying rocks and reefs are about it, making it dangerous to approach and affording but slight shelter for an anchorage. Here the vessel (of about 300 tons) lay, with ground tackle of the weight for a craft of twice her size. Much of the time fresh winds prevailed, accompanied by the usual ugly ground-swell, and in consequence of her being long, low, and sharp the deck was at such times frequently flooded; nevertheless, she "rode out the whole season, though wet as a half-tide rock," and a valuable cargo of skins was procured, which brought an unusally high price in the European market on account of the regular Russian supply being cut off in consequence of the war.

The exact facts, however, have been kindly communicated to me by Mr. C. A. Williams, of New London, Conn., who is familiar with all the details from intimate personal knowledge with all concerned. In 1853 Capt. Guarden Allyn, an experienced whaling captain then about 70 years old, returned from the Okhotsk Sea with the first account of the seal rookery on Robben Island. The firm of Perkins & Smith, of New London, then built for him the bark *N. S. Perkins*, in which he went, accompanied by his wife, to Robben Island in 1854. In much the manner described by Captain Scammon a cargo of skins was secured, which, according to Mr. Williams's recollection, amounted to about 20,000. These were brought to the Hawaiian Islands and from there shipped to the United States and London. The following season the bark returned to Robben Island and secured 15,000 skins, while the brig *Zoë*, Captain Rodgers, obtained 13,000 skins.

Capt. Daniel Webster, in 1896, also told me that a Captain Fisher, a year or two after, only got 300 skins.

Robben Island was thus "practically cleaned out;" the whaling industry also came to an end, and the very existence of seals on the lonely rock was almost forgotten.

At the breaking up of the great Russian-American Company in 1869, many enterprising citizens of California and Alaska turned their attention to the Pribylof Islands and the Commander group; the Kuril Islands and the Okhotsk Sea attracted the attention of Captain Limachevski. With a schooner manned by Aleuts (Kadiak Islanders?) from Urup Island, the station of the Russian-American Company on the Kuril Islands, he sailed, in 1869, to Robben Island. During the 14 years of rest since the Crimean war the seals had again multiplied to such an extent that they were occupying the entire beach all around the rock, as in the days when first discovered. Capt. D. Webster has even assured Mr. C. H. Townsend that the bachelors in 1870 also invaded the top of the plateau. The Urup Aleuts, who had never had any experience with the driving of fur seals, were afraid of the vast numbers which blocked the way, so that no landing was effected, and Limachevski had to sail away.

In 1870, however, the seals did not fare so well. In that year at least two schooners raided the island. Capt. D. Webster, of Pribilof Island fame, arrived there in the bark *Mauna Loa*, with the schooner *John Bright* as a tender, and the number of skins taken on Robben Island was about 15,000.[1] He told me that he took everything he could lay his hands on, females and young, and that only 600 pups were left. The skins were salted.

The island was "practically cleaned out" again, so that when the representatives of the lessees of the Russian Seal Islands arrived on Tiuleni in 1871 "there were not over 2,000 seals to be found on the entire island." Capt. G. Niebaum, a member of the firm, landed there in August, and seeing the depleted state of the rookery ordered that no killing should take place there that year, nor, in fact, until "such time as seemed prudent to resume, so as to give the rookeries opportunity to recuperate, leaving strict orders to the guard ship to protect them against molestation."[2] The result of this wise order was that in 1873, not more than two years after, the rookeries had so far recovered that sealing could be commenced again on a small scale, and about 2,700 seals were taken that year by the company, "knowing that the killing of the useless male seals would accelerate the increase of the herd. From this time forward the herd showed a steady and healthy growth,"[2] and would probably have continued so had it not been for the unparalleled boldness of the seal pirates. They fitted out in Japan and sailed under various flags, British, German, Dutch, United States, etc., and from about 1879 paid special attention to searching for hitherto unknown seal rookeries on the Kuril Islands and elsewhere in the Okhotsk Sea, as well as raiding those already well known. Robben Island, being conveniently located, poorly protected by a single schooner and a few Aleuts, and absolutely unprotected later in the season, after the company had finished the legitimate catch, was particularly exposed to the ravages of these marauders. The total number of seals indiscriminately slaughtered by them on that lonely rock will never be known, nor, probably, the names of all the vessels that took part. The following few particulars, however, will give a good idea of the slaughter and the methods.

In 1878, according to a memorandum kindly furnished me by Capt. H. J. Snow, of Yokohama, the schooner *Sarah Louise* took 780 skins on Robben Island. In 1879 the *Matinée* is said to have taken 640 seals there, and the *Mary C. Bohm* 450; together, 1,090. It is probably to the raids of this year that W. F. Upson refers (Fur Seal Arb., VIII, p. 724) when he states that he "was on the first schooner that raided Robben Island, the *Matinée*, fitted out by H. Liebes, T. P. H. Whitelaw, and Isaac Leonard," of San Francisco.

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[1] Webster, according to the British Bering Sea Commission, put the number of skins he assisted in taking at 15,000, but they add that "Kluge's estimate of the number taken was 10,000." When reading this report on Bering Island in 1895, Mr. Kluge stated to me that he understood Webster's catch in 1870 to have been about 20,000, and that he did not "estimate" 10,000, as alleged by the commissioners, he not having been there at the time. (Rep. Brit. Bering Sea Comm., p. 89.) Mr. C. H. Townsend informs me that Webster gave him the following account: "Between May 8 and August 20 he killed 14,600. Half of the entire catch were females, although no females were killed until after the pups were all born, or about the middle of July. The youngest pups, left motherless, all died, the older ones being still alive when he left." Mr. Williams, the owner of the vessels, told me that, according to his recollection, the total catch of the two vessels was about 15,000.

[2] Niebaum, Fur Seal Arb., III, p. 203.

Captain Snow affirms that I. Leonard was head hunter on board the *Sarah Louise* in 1878, and on the *Matinée* in 1879.

In 1880 the company's schooner *Leon*, Captain Blair, landed at Robben Island with the Aleut workmen on June 13 and found there already two schooners, the *Otsego* and the *North Star*, though they had been unable to do anything, as the seals had not yet arrived. During the summer schooners were scarce. On June 22 the *Vladimir* touched there; on July 16 the *Stella*[1] came around, and on July 20 the *Flying Mist.* On September 4 the company's steamer *Aleksander II*, Captain Sandman, called and took off the 3,330 skins. Sandman records in his log that he found "on shore a considerable number of pups and females, but very few killing seals." After the lessees' vessel left, however, things became lively. When Capt. A. C. Folger arrived in the schooner *Adèle*[1] he found 11 schooners already assembled there[2] and he states (Fur Seal Arb., VIII, p. 662) that "altogether we got 3,800 seals; we killed them all or drove them away." According to Snow the following schooners secured catches, viz: *Otome*, 558 seals; *North Star*, 1,972; *Helena*, 900; *M. C. Bohm*, 1,064; *Alexander*, 1,100; total in 1880, 5,594 seals. *Otsego* and *Stella*, according to him, had only 3 and 5 seals respectively.

In 1881 a number of schooners again hovered around the island, waiting for the guard ship to leave, even as late as November. About the first of that month Mr. E. P. Miner arrived in the *Annie Cashman* and met three other schooners there. "We went ashore and clubbed the seals. Our schooner's share was 800 skins." (Fur Seal Arb., VIII, p. 701.) Snow's figures for 1881 are as follows: *Diana*, 17; *Helena*, 380; *Otsego*, 1,075; *Adèle*, 1,200; *M. C. Bohm*, 1,450; *O'Heade*, 750; total, 4,872.

This feature of the schooners raiding in concert is well worth noticing. Captain Folger corroborates it: "We worked together, and the schooners would divide up." The latter also mentions how the schooners succeeded in eluding the vigilance of the guard ship and making raids during its absence:

> We had the guard [i. e., the Aleut workmen] in our pay, and when the *Leon*, which had been sent there to guard the place, would go away, lights would be put out, and we would come over from Cape Patience, where we had men on the lookout constantly, or if we got impatient the fastest sealer in the fleet would go there and be chased by the *Leon* (a sailing vessel), and the others would make the raid. (Fur Seal Arb., VIII, p. 663.)[3]

The experience of the authorities with the raiders in 1881 led to more vigorous attempts to protect the rookeries. The first step was the issue of the consular warning referred to in detail elsewhere in this report (chapter on Raids of Commander Island Rookeries, p. 188), and to enforce it a stronger force of natives was sent to the island in 1882. They were well armed and under the command of a noncommissioned kossak officer. The proclamation and the presence of patrolling men-of-war had evidently some restraining effect upon the pirates in so far as the Commander Islands were concerned, but the result was only that the raiders concentrated their efforts on Robben Island. At least 13 schooners hovered about that rock in 1882,[1] and, emboldened by the previous success, it is alleged that they actually carried the island by armed force. As the greatest loss to the island usually was inflicted after the guard ship had left in autumn, most of the raided seals being females and young ones of both sexes, it was determined that the guard should winter there, and the men consequently remained when the *Leon* sailed. Shortly after, 6 schooners anchored off the island and each landed 10 well-armed men. The Aleuts, thus outnumbered, did not dare to resist, and were locked up in the house. The crews of the schooners then quite leisurely went about the clubbing of the seals. It is probably to this raid that E. P. Miner, schooner *Otome*, refers when stating that the raiders "landed and killed about 12,000 seals"[2] (Fur Seal Arb., VIII, p. 701). The natives, being thoroughly intimidated and seeing the smoke of a steamer, took to their boat and made for it. It proved to be Philippeus's supply steamer *Kamchatka*, on its return trip along the Okhotsk coasts. The men were taken to Korsakovski, a port near the south end of Saghalin, and wintered there.

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[1] It seems that the *Stella* and the *Adèle* are the same vessel. Captain Snow informs me that the *Stella* was bought by Mr. Retz, of Yokohama, in 1880 and renamed the *Adèle*.

[2] Snow refers this visit to 1882 and states that the *Adèle* "visited Robben Island for the first time in 1881." The latter statement can not be correct, however, if it is true that *Stella* and *Adèle* are the same vessel, for I have myself extracted from the *Leon's* log of 1880 that the *Stella* visited Robben Island on July 16 of that year.

[3] So bold did the schooners become that when Lieutenant Shamof, of the cruiser *Razboinik*, in 1884 sent to guard Robben Island, landed near Cape Patience, Saghalin, on May 21, he found there two sheds containing about 15,000 pounds of salt, etc., three skiffs, and a whaleboat, and six Japanese, the whole outfit belonging to a schooner from Japan, of which a certain Johnson was said to be the captain (Ausland, 1885, pp. 536–537).

This is the story of the kossak and natives. On the other hand, it has been asserted that they were bribed. So far as the result is concerned it matters very little which story is the true one. The rookery was now becoming so depleted by illegal, reckless, and indiscriminate slaughter that it was seriously considered by the authorities whether it would not be the better policy to kill off the few remaining seals and to abandon the island. If the seals were not killed by the company they were taken by the raiders, extermination was sure to follow, and it was only a question who were going to have the skins—the legitimate lessees, who were paying for the privilege and acting under contract with the legal owner of the island, the Russian Government, or the pirating poachers, who knew well that they were doing lawless acts, and who, moreover, also knew that their penalty for the criminal business, if caught, would be confiscation and, possibly, hard work in the mines of Siberia. Under those circumstances it is hardly to be wondered at that the decision was to disregard the distinction between sex and age in the killing by the lessees, as it was done by the poachers. This was undoubtedly done in 1883, and it is quite possible that some of the men, when more seals had been clubbed than the little gang could properly skin, in their zeal may have slashed the skins to prevent the raiders, who were continually hanging around, among them the schooners *North Star*, *Helena*, and *Adèle*, from profiting to the extent of even having the seals clubbed for their benefit.[3] It is utterly unjustifiable to characterize the proceeding as "barbarous" in contradistinction to that of the poachers. The number of seals thus killed has been grossly exaggerated. Some of the poachers have estimated it to be from 12,000 to 20,000 seals, but it is pretty safe to say that there were not nearly so many seals at that time on the island, all told. The number mentioned by another of the poaching captains (Fur Seal Arb. VIII, p. 664), viz, 3,500, is undoubtedly much nearer the mark. Captain Snow, in his memorandum, says 2,000.[1]

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[1] Snow gives the figures of the catches of 9 Yokohama schooners as follows for 1882: *Diana*, 450 seals; *Helena*, 1,700; *Ada*, 450; *Otome*, 450; *Alma*, 1,700; *Felix*, 500; *Adèle*, 800; *Alexander*, 800; *Rose*, 1,500; total, 8,560. "The *Otome* was not at Robben Island that year although she is credited with 450 skins from there. This is correct, nevertheless. She remained in Shikotan [Kurils] as store ship for three of the others and so got a share."

[2] "12,000 killed is an exaggeration; less than one-half is nearer the truth." (Snow, letter January 28, 1898.)

[3] Snow's figures are as follows: *Rose*, 474 seals: *Felix*, 350; *Helena*, 456; *Adèle*, 350; *Diana*, 348; *Ada*, 320; *Otsego*, 320; *Alma*, 320; *Mary C. Bohm*, 320.

Notwithstanding all this, enough seals hauled up on Robben Island in 1884 to justify the lessees in continuing the regular killing that season. They were particularly encouraged to do so, since the Government had stationed a man-of-war, the *Razboinik*, to guard the rookery. Four seizures were made, among them the German schooner *Helena*, Captain Golder, which had "raided that island five years." Others escaped, like the *Felix*, which got 500 skins (Fur Seal Arb,. III, p. 358) and the *Rose*, which secured 1,700, according to Snow. The killing of other classes of seals by the company on shore, however, was brought to a stop by Col. Nicolai Voloshinof (since deceased), who visited the island that year on a tour of inspection.

The Government, seeing that energetic means had to be taken if the seals were to be protected at all on Robben Island, in 1885 stationed a regular naval force of 16 sailors of the Siberian flotilla and 1 officer[2] on the island, which was removed, however, before the middle of October. The company that year obtained less than 2,000 skins, but the schooners, late in autumn, made additional hauls; thus the *Penelope*, Capt. E. P. Miner, on her part alone got "about 800 skins" (Fur Seal Arb., VIII, p. 702), and, according to Snow, the *Otsego* got 850, the *Felix* 500, and the *Rose*, *Penelope*, and *Diana* each 600; together 3,150 skins. Captain Blair, of the *Leon*, estimated the number of seals on the island that year to be about 6,000.

For four years—1886 to 1889, inclusive—the company refrained from taking any skins on the island; but there were still some left for the raiders, who appear to have visited the rock every year. The British Bering Sea Commission states that "these schooners must have obtained at least 4,700 skins" (Rep., p. 89), but, according to Snow, the *Arctic* is said to have obtained 3,200, the *Rose* 800, and the *Ada* 2,000 skins in 1886, while in 1888 the *Arctic* again took 1,500 and the *Rose* 1,440. Thus, during these two years alone at least 9,000 seals were killed. From the same source I learn that in 1890 the *Nautilus* got 1,651, and *Benton* 3,200. In 1890, the last year of the lease of Hutchinson, Kohl, Philippeus & Co., 1,456 skins were secured by them.

With the lease of the islands by the Russian Seal Skin Company the regular killing was again resumed in 1891, but the poor result led to the abandonment of the attempt in 1892. In 1893 the rookery had recovered sufficiently to yield the company 1,500 skins; 1,000 were taken in 1894, and 1,300 in 1895.

In all these years the raiders continued to prey upon the island in the autumn with but scant danger of being captured. In October, 1891, however, Captain Brandt, commanding the *Aleut*, upon returning to the island unexpectedly, captured two schooners, the *Arctic* and the *Mystery*, both fitted out in Yokohama but flying the

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[1] In a note appended to a certain memorandum often alluded to, it is stated that the company's "vessel was arrested and taken to Vladivostok the next season" (1884) for the killing of females and the destruction of their skins in 1883. This statement rests on misinformation. It was on account of incidents in 1885 (not 1883) that Colonel Voloshinof sent the *Leon* to Vladivostok that year (not 1884), where she was at once released by the governor.

[2] This force was afterwards increased to 2 officers and 20 to 22 men until 1896, when it was again reduced to 1 officer and 15 men.

British flag, and having 1,500 seal skins on board (Brit. Behring Sea Comm. Rep., p. 89). Of these 1,200 were secured on Robben Island, according to Snow.

The latest raid on Robben Island was undertaken on October 29, 1895. The British schooner *Saipan* (now the *Silver Fleece*), sailing from Yokohama early in October ostensibly on a shark-fishing expedition, landed 17 of her crew on Robben Island. She sailed away, promising to return in eight days. In the meantime the Russian transport *Yakut*, which did patrol duty around the Commander Islands during the summer and had already taken the guard off the island, returned unexpectedly, and found the 17 men with a great number of slaughtered seals. They were arrested and brought to Vladivostok. The schooner returned to the island too late, and thus escaped capture. The men were condemned to work on the roads and streets in Vladivostok. As one of the British commissioners has alluded to the incident[1] it is necessary to refer more specifically to the deplorable raiding of the Robben Island rookery by some of the very officers and men who were stationed there to protect it. It is said (for official statements have not been forthcoming) that officers of the guards in 1893 and 1894, as well as the then captain of the guard ship *Yakut*, were involved in the scandal. It was carried to such an extent that salt was brought from Vladivostok in this vessel, and that the skins, which were taken away in a chartered schooner, were secured on land after the Aleut workmen had been taken off by the company's vessel in the fall of the year. The secret finally leaked out and a court martial investigated, with the result that one of the younger officers committed suicide and the captain alluded to was compelled to leave the navy. When my information closed it was uncertain whether further punishment would be meted out. It it estimated that about 3,000 skins were taken in this way, though the figure is very uncertain.

Capt. D. Grœnberg, of the *Bobrik*, in 1895 reported that females were present in fair numbers and that the proportion of bulls to females was about 1 in 40. The weight of the skins taken was good, and yearlings were quite scarce. He also mentioned having observed an unusual number of dead pups.

Number of skins taken by the lessees of Robben Island from 1871 to 1897.

Year.	Seals.	Year.	Seals.
1871	0	1886	0
1872	0	1887	0
1873	2,694	1888	0
1874	2,414	1889	0
1875	3,127	1890	1,456
1876	1,528	1891	540
1877	2,949	1892	0
1878	3,140	1893	1,532
1879	4,002	1894	1,000
1880	3,330	1895	1,300
1881	4,207	1896	269
1882	4,106	1897	214
1883	2,049		
1884	3,819	Total	45,514
1885	1,838		

The total number of seals known to have been killed illegally by the raiders and others on Robben Island between 1878 and 1895 amounts to the astonishing figure of at least 53,000 seals of both sexes, or an average of 2,944 per year, as against 33,319 males only, or 1,851 per year, legally taken by the lessees during the same period.

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[1] Barrett-Hamilton's Report on the Russian Seal Islands in the North Pacific, 1896, p. 5: "It is now an open secret that within very recent years the guard appointed to protect the island betrayed their trust, and participated in the unlicensed slaughter."

In addition, there is no doubt that the Robben Island herd must have suffered somewhat from pelagic sealing proper, though the extent can not be known.

MY VISIT TO ROBBEN ISLAND IN 1896.

The *Albatross* anchored off Robben Island on August 28 at 6.15 p. m., after having visited the principal islands in the Kuril chain upon which rookeries had existed or been reported to exist. Landing being impracticable that evening on account of the surf, was postponed until next morning.

Unfortunately, the 29th of August was rainy and entirely unfit for rookery inspection. However, I landed in the whaleboat at 7.30 a. m. To my surprise I found the low beach surrounding the high rock to consist of sand and pebbles and not of a rocky reef, as I had been led to believe from the appearance of the maps.

Lieutenant Kolubakine, I. R. N., in charge of the island and commanding the naval guard, met us, and conducted us to the officers' quarters, the uppermost house in the narrow gulch leading up to the plateau. Below this the barracks for the sailors are located, and below these again the building containing the bath and the condenser. The "company's buildings," consisting of a small ramshackle frame hut for the Bering Island natives and a still smaller and more dilapidated salt house propped up with sticks, are located on the beach at the base of the rock farther toward the south end of the island.

From Lieutenant Kolubakine I learned that the company's steamer *Kotik*, Capt. C. E. Lindquist, had already been here on the 19th of August, but had not taken the natives or skins off, as contemplated, on account of the small number of skins (200) then obtained, in the hope that it would be possible to increase the catch. The *Kotik* had visited the island of St. Ioma, but no landing could be effected and no seals had been seen there.

We went at once to the top of the rock, which we found perfectly smooth and level and nearly devoid of vegetation, to look at the seals, which are located on the other side just opposite the houses. They occupied a very small place, and the whole did not look much bigger than the south rookery on Bering Island. As it was raining hard, a good many were in the water, so that most we saw on shore were pups and some bulls.

Until this year, I was told, the bachelors used to haul out by themselves near the southern end of the island, but this year there were so few that they mingled with the breeding seals on the rookeries, and both cows and bachelors had to be driven off the killing grounds and the latter culled out there. The killing grounds are on the grassy flat on the beach at the south extremity of the rock. The carcasses are now buried in the sand, to prevent them from being thrown up on the beaches. Thus far only 232 skins have been taken, a terrible falling off.

Lieutenant Kolubakine kindly submitted to my interviewing, and from him I learned the following facts:

When he landed on Robben Island on June 15 (new style), this year (1896), there had only arrived 30 bulls and 1 cow. On June 26 there were about 200 females, and on June 30, 400. At its height the rookery contained 70 bulls and 1,000 cows and bachelors.

The wind was rapidly increasing in strength and the landing threatened to become impracticable. I therefore reluctantly returned to the ship. Captain Moser, anticipating a storm, decided to stand out to sea and seek a lee under Sakhalin. It was well that he did so, for we soon found ourselves in a howling gale, the worst weather we had yet encountered on the trip. Landing on Robben Island, therefore, could not be effected again until August 31.

The weather on that day being fine, a number of photographs were taken (pls. 1–9).

Going ashore about 7 o'clock a. m., I went at once to the rookery, where as yet but a few cows or pups had gone into the water. At 8 o'clock there were about 600 females, as counted by me, and 18 bulls. No bachelors could be distinguished. The pups—considerably in excess of the cows—were lying too close together to be counted.

The observation spot on top of the rock just behind the houses is a most excellent one, as the seals are located only about 50 feet below, and, as I have suggested before, Robben Island is the ideal spot for anyone who wishes to study the habits of the seals on the rookery. A little precaution is needed in approaching the edge of the rock, as one is so near that the seals are easily frightened. On the day of my visit the only drawback was the overwhelming number of small flies covering everybody and everything.

The present rookery beach consists of the same pebbly sand which forms the beach all around the Robben Island rock. There are, consequently, no indications to be found of the previous extent of the rookery, and even the scanty vegetation of Elymus and the yellow-flowered composite, *Senecio pseudo-arnica*, fail to furnish any evidence. The Robben Island beach, on the whole, is about as different from the rookery beaches of the Pribilof and Commander Islands as it can well be.

As a consequence of the sandy and loose nature of the beach, no kelp grows on it, as a matter of course, and if the pups, as alleged by Captain Webster, have been obliged to feed upon the alga *which grows on the beach*, there would have been no seals there now. However, a considerable quantity of large, coarse kelp, grown on the rocky reef in deep water, was washed up on the beach by the gale of the previous day. At the southern end of the breeding ground a small pod of pups were amusing themselves by playing with it half in and half out of the water, where the gentle surf agitated it. They would take large pieces of it in their mouths and shake it exactly as kittens would shake a piece of paper, and it was quite apparent that it was the agitation of the leaves by the waves which incited the pups to the play, as the kelp everywhere else was left in peace.

The pups were frisky, and a good many of them went into the water later on, some of them being quite expert in diving through the surf. All seemed to be in excellent condition, and I saw none that might be considered sick or starving.

I counted seven dead pups only on the beach back of the seals, but a few may also have been lying between the latter, though a pretty close examination with the binocle failed to reveal any. Five of these carcasses appeared fresh and were quite plump; only two are rather old and flattened.

Quite a number of turnstones (*Arenaria interpres*) were busy among the pups, picking flies off the sleeping ones or dodging those awake, who seemed to delight in chasing the birds.

As the sun rose and the temperature got higher more and more seals went into the water, though none seemed oppressed by the heat. The pups had an ideal day for swimming practice, but the great majority remained on the shore. These did not, to any extent at least, flock in pods by themselves, but formed a compact, continuous line behind the cows. The pups were as yet mainly black, with indications of gray, only a few of them being entirely gray.

The bulls, with a few exceptions, looked young and small. An attempt was made by them to prevent the cows from going into the water, but with poor success. At 1.30 p. m. there were not more than about 350 females on shore.

During the day I tried to obtain some seal skulls, but failed to get a single one, as all carcasses are thrown into the sea or else buried in the sand.

Lieutenant Kolubakine kindly furnished me with the following temperatures of the air for the day: 8 a. m., 54.52° F. (12.4° C.); 12 noon, 60.8° F. (16° C.).

During my stay on the rock the *Albatross* had steamed away on a dredging trip. After her return Captain Moser came ashore and viewed the rookery with us.

To show the insignificance of the Robben Island herd in 1896 it is only necessary to give the details of the drives up to August 16:

	Skins.		Skins.
July 17 (new style)	37	July 29	18
21	4	August 1	21
22	12	5	17
24	14	8	13
27	11	12	4

It certainly seems to be a big apparatus in order to protect the handful of seals now on Robben Island to have the 30-mile limit patrolled by men-of-war and to station on the rock an officer and 15 men for five months of the year. The 269 skins taken in 1896, and 214 in 1897, must have come pretty expensive by the time the bills are counted up.

3.—ST. IONA ISLAND.

This is a small island, about 2 miles in circumference, situated in 56° 25′ north latitude and 143° 16′ east longitude, 120 miles north of the northern extremity of Sakhalin Island and a little more than 150 miles east of Port Ayan. It is said to be about 1,200 feet high and to have a number of detached rocks lying off its west side[1] (pl. 103).

The sides are said to be very precipitous, with only a small, curving beach on one side, where landing can be effected in favorable weather. The rookery was situated at one end of this beach.

Capt. C. E. Lindquist, of the *Kotik*, who was off the island on August 12, 1896, trying in vain to make a landing, tells me that no seals were seen. He kindly gave me the appended sketch of St. Iona as it looks NNE., 6 miles off (pl. 103.)

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[1] "*St. Iona Island*, in lat. 56° 22½′ N., long. 143° 15¾′ E., is merely a bare rock, about 2 miles in circumference and 1,200 feet high, surrounded on all sides, except the west, by detached rocks, against which the waves beat with great violence, and which probably extend a considerable distance under water. With the island bearing north, distant 12 miles, Krusenstern had 15 fathoms water, but when it bore west, about 10 miles, no bottom could be obtained with 120 fathoms" (China Sea Directory, IV, 1884, p. 178). On the latest admiralty chart (No. 2382) it is now located in lat. 56° 23′ N., long. 143° 17′ E.

There is a rock not shown on the older charts[1] 9½ miles S., 21° 30′ E., *true* from St. Iona, with an approximate position on Brit. Adm. Chart No. 2388, lat. 56° 14′ N., long. 143° 23′ E. (Russ. Hydr. Circ. 265; Not. Mar. 7, 1896).

From a memorandum kindly given me by Capt. H. J. Snow it appears that the seal rookery on St. Iona was first exploited in 1889, when the *Rose* took 495 skins there. Hermann's statement (Fur Seal Arb., VIII, p. 709) that the seals were first discovered there by Captain Pine, of the *Arctic*, in 1889, therefore does not seem to be correct. According to Snow, who was there himself in the *Nautilus*, no less than four schooners visited the rock in 1890, taking 879 seals together, viz, the *Nautilus*, 80; *Benton*, 280; *Arctic*, 280; *Diana*, 239. In 1891 the *Arctic* got 400[2] and the *Mystery* 67 seals on St. Iona, but both vessels were seized that year by a Russian man-of-war (see p. 77). During the following year the *Norma* took 103 seals and the *Diana* 100 at St. Iona. The *Anaconda* got about 200 in 1895 and, finally, the *Josephine* succeeded only in taking 6 in 1896. We know, consequently, of about 2,250 fur seals having been taken on St. Iona between 1889 and 1896.

I have mentioned above that the *Kotik's* boat, on August 12, 1896, could see no seals at the former rookery, and it is therefore pretty certain that St. Iona belongs to the same category as the Kuril Islands, the rookeries of which are also nearly extinct.

I may finally quote the statement by William Hermann, a seal hunter of San Francisco, that eight years ago Captain Peterson, of the schooner *Diana*, of Yokohama, was there, and there were no seals there (Fur Seal Arb., VIII, p. 709).

This does not necessarily mean that we have to do with newly formed rookeries on St. Iona. In the first place, it is not stated at what date the island was visited; in the second, the seals may have been easily overlooked. I will mention an instance to show this: In 1881 Capt. J. Sandman, in the *Aleksander II*, in passing the Kuril chain was looking for the possible existence of fur-seal rookeries on the uninhabited islands. His attention was particularly drawn to Srednoi Island, quite a small and insignificant affair. He happened to approach it from the Pacific side, and seeing nothing but sea lions went away. Imagine his chagrin when he heard that Mr. Snow landed on the island that same season, taking several thousand seals. They were located on the Okhotsk Sea side; at least that was Sandman's explanation, but Captain Snow says Sandman was there too early.

OTHER ISLANDS.

Omitting all references to breeding rookeries on the mainland of Kamchatka as based upon hearsay, and in all probability resting on misidentification of young sea lions[3] I may briefly mention that it has been stated that fur seal breed on various other islands in the Okhotsk Sea. Philip H. Powers has thus been quoted as an authority for the statement that fur seals occur at the *Shantar Islands*, a numerous group of large and small islands in the Shantar Bay, 55° north latitude and 138° east longitude. I had a long conversation with Captain Powers about the matter last summer (1897) and he assured me not only that no rookeries or breeding grounds occur there, but the lateness of the ice in that part of Okhotsk Sea renders it quite impossible for the seals to congregate there. It has also been stated that seals had been taken on Talan Island, in Tausk Bay, close to the Okhotsk coast. The story is unsupported and probably lacks all truth. Captain Grœnberg, who has about as much experience and knowledge relative to the seals and seal business in the Okhotsk Sea as any man living, in a letter dated February 27, 1897, informs me that he does not know of fur seals occurring in Tausk Bay, and that he has never heard of fur-seal skins having been brought by the natives to the trading posts of Philippeus & Co., or any other company doing business in Tausk, Okhotsk, or Shantar bays.

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[1] Curiously enough it seems to have been known before and forgotten, for it is clearly down on a map published in 1802 in St. Petersburg by the quartermaster-general's department.

[2] William Hermann (Fur Seal Arb., VIII, p. 709) says 551 seals.

[3] In corroboration of this assertion I quote the following from a letter written by Captain Grenberg, then commanding the *Bobrik*, December 22, 1896: "I also coasted the east shore of Kamchatka from Cape Shipunski to north of Cape Stolbovoi twice during the past summer in order to locate seal rookeries, but did not find any, and what is more, did not come across a single seal in the water." I, myself, had a similar experience in the *Kotik* during 1897, between the mouth of the Kamchatka River and Stolbovoi.

At one time both the Russian Government and the Russian Seal Skin Company suspected that unknown fur-seal rookeries might be discovered in Okhotsk Sea, and in 1895 the authorities in St. Petersburg granted the company the right to take seals on all the islands, known and unknown, upon a stipulated tax, and upon condition that a Government officer accompany the vessel dispatched by the company. Since then the vessels of the company have diligently searched for such places, but entirely without success, and it is pretty certain now that no such exists.

III.—SEAL LIFE ON THE COMMANDER ISLANDS.

HISTORICAL AND GENERAL.

The northern fur seal (*Callotaria ursina*) was known to the natives of Kamchatka and the invading Russian promyshleniks long before the islands to which they resort to breed were discovered. The seals were seen to arrive in spring, on their way north and east, and to return in autumn, and the correct conclusion was formed that the seals went to some unknown coast to bring forth their young.

The discovery of Bering Island revealed this unknown coast. Steller, the naturalist of Bering's expedition, had a whole spring season on the island in which to study their habits, and that he made good use of it is evidenced by the account he gave of these animals in his famous memoir, "De Bestiis Marinis," published in 1751 in St. Petersburg.[1] In this paper, written in the Latin language and finished on Bering Island for publication, he established the salient points in the natural history of the fur seal. Two figures, one of a bull (fig. 1) and one of a female (fig. 2, pl. XV), probably made by the artist Berckhan, as shown by Dr. E. Büchner (Mém. Ac. Imp. Sc. St.-Pétersb. (7), XXXVIII, No. 7, pp. 12, 13), accompany the descriptions. Fig. 2, at least, is a fairly characteristic representation of a bull, and superior to several figures published much later.

Steller described in some detail the external and internal anatomy of the fur-seal, or sea bear, as he called it, and gives a pretty accurate account of their migrations and their habits on the island during the breeding season. He stated that they are polygamous, each bull having "8, 15 to 50 females;" describes the harems and the bravery of the bulls fighting for the possession of the females; the birth of the one pup shortly after the arrival of the mothers; the nursing and the play of the pups; the long fast of the bulls on the rookery, etc. In fact, he covered nearly all the essential features of their lives. Later researches have made but few corrections, and the additions have been those of detail and elaboration.

Such detail and elaboration was to some extent furnished by the venerable "apostle of the Aleuts," Ivan Veniaminof, who gathered his information on St. Paul Island, Pribilof group, more than eighty years later than Steller. A very precise and concise account, both of the natural history of the animal and of the sealing business, communicated by Veniaminof to Admiral von Wrangell, then chief manager of the Russian-American Company, was published In 1839 by the latter in the German language,[2] and was thus made easily accessible to the scientific world of his day. His somewhat more voluminous account in the Russian language did not appear until the following year.[1] He carefully distinguishes the various classes of seals—the *sikatchi*, or old bulls; the *polusikatchi*, or young bulls; the *holustiaki*, or bachelors; the *matki*, or mother seals; the *kotiki*, or pups, and the yearlings. The sikatchi in spring arrive first on St. Paul Island, about April 20 (old style; May 2 new style), "even if the island is still beset by ice,"[2] and take up the same place as the previous year, being extremely fat upon their arrival. They pass most of the time sleeping, before the arrival of the females, when the sikatchi tries to get hold of as many as possible for his harem, in which he succeeds not without bloody contests with other males. "From 1 to 150 females have been observed with one sikatch, the number depending simply upon his bravery. He is the unrestricted lord, the guardian and protector of his harem. He take takes no food whatever when staying ashore."

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[1] Novi Comment. Acad. Sc. Imp. Petrop., II, pp. 289-398; pp. 331-359 relate entirely to the fur seal. A translation of this paper will be found in Part III of this Report.

[2] Statistische und Ethnographische Nachrichten über die Russischen Besitzungen an der Nordwestküste von Amerika. Gesammelt von dem ehemaligen Oberverwalter dieser Besitzungen, Contre-Admiral v. Wrangell. St. Petersburg, 1839, 8^{vo}, XXXVIII + 332 pp. and map; pp. 39-48 treat of the "Seebär (*Phoca ursina*)."

A résumé of Khlebnikof's observations on the habits, brief but accurate, had already been published by Lütke as early as 1835 (Voyage aut. Monde, I, pp. 252-264) in the French language.

The polusikachi and holustiaki arrive later and congregate in large companies upon the grounds which are usually separate and more distant from the sea than the breeding grounds. The females commence to arrive on May 26, rarely on May 21, shortly before giving birth to their single pup, the season for the delivery being from the end of May "through the whole of June, and even as late as July 10." The kotiki arrive usually by southerly winds, but not with the same regularity as the others, all not having arrived even by the middle of June, "as there are instances of yearlings having arrived as late as July." The sikatch comes together with the female some time after the birth of the pup, but only once; he "is able to cover from 21 to 25 females in 24 hours." The pups "feed exclusively upon the milk of their mothers until leaving the land. The female never suckles her young while in the water, but coming ashore for that purpose attends her offspring in a resting position." The pups do not go into the water until they are 30 to 35 days old, becoming familiar with the water when 40 to 50 days of age. "The color of the pups when born is black, but from September 10 changes to gray, the old hair being cast off." The seals leave the island (St. Paul) gradually, beginning about October 5, and always with north and northwest winds, the young ones remaining longest. A few old bulls may occasionally be seen in November, or even December, but none in January or February. "Very rarely 2 or 3 sikatchi show themselves again in March, but always for a very short time only."

I have thought it worth while to give the above short summary of the natural history as it was known in 1840, since it has been asserted that from the time of Steller to about 1870 "the scientific world actually knew nothing definite in regard to the life history of this valuable animal." Not even the pictorial representation of the northern fur seal in that period was so bad as it has been made to appear, as will be plain from an inspection of Choris's drawing of a fur-seal rookery on St. Paul,

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[1] Zapiski ob Ostrovakh Unalashkinskago Otdiela. St. Petersburg, 1840, 2 vols.

[2] The arrival of first bulls on Bering Island rookeries are reported for a few years as follows:

Date.	No. of bulls arrived.	Locality.
1879, May 5	2	North rookery.
1880, April 27	3	Do.
1881, May 20	2	South rookery.
1882, April 19	4	North rookery.
1883, May 23	2	South rookery.
1884, April 27	2	North rookery.
1885, May 10	1	Do.

(On Copper Island the first bulls, 7 in number, were observed in 1895 on May 13. (Glinka.)

published in 1822 as pl. xv of his "Voyage pittoresque autour du Monde" (Fol., Paris, 1822), of which I append a greatly reduced copy on pl. 59.

Since Veniaminof's account, no original contributions to the natural history of the fur seal, of any magnitude, appeared until the studies of Scammon, Bryant, and particularly Elliott, were given to the public in the early seventies. These, with the bulky literature which sprang up as part of the "Fur Seal Arbitration" case, are too well known to need any further comment in this place.

The natural history of the Commander Islands seal is essentially that of the Pribilof Islands seal. Even their migrations, although along entirely different and distinct routes, show parallel phenomena. The route of the Commander Islands herd, as we have seen, was known to Steller in a general way, but it is only recently, since the pelagic sealers are following the migrating herds, that the routes have become known in detail. Mr. C. H. Townsend, the naturalist of the United States Fish Commission steamer *Albatross*, has made a special study of this branch of the subject and has kindly furnished me with the following notes relating to the migrations of the Commander Islands herd as shown by the records of the pelagic sealers:

> Pelagic sealing off the coast of Japan usually commences about the middle of March and lasts until the middle of June. The seal herd appears to be massed off the coast between the latitudes of Yokohama and Cape Noishap (the eastern point of Yezo Island) in March, April, and May. In March sealing commences off Hondo Island (Nipon); in latitude 36°, where seals are also of common occurrence in April, but they are then moving slowly northward. In May the best sealing is found south and east of Yezo Island, Cape Yerimo (the southeast point of Yezo) being a favorite sealing ground. In June they are usually a little farther north, being taken generally off the eastern coast of Yezo and the most southerly of the Kurils. They are also taken in June off the more northerly Kurils, but the herd is then farther off shore and more scattered.
>
> In the Japan region proper sealing is carried on from the coast out to a distance of about 300 miles, while in February straggling seals have been taken as far south as the Bonin Islands. Seals occur in the Sea of Japan, catches having been made at several points there and in La Perouse Straits by the schooner *Penelope*, in a voyage around Yezo Island during the past season.
>
> Sealers crossing the Pacific in the latitude of Yezo Island pick up seals at many points between Japan and the longitude of 180°. In June and July scattered bands of seals, presumably of the Commander Islands herd, occur 500 or 600 miles south of the western Aleutian Islands.
>
> The charts accompanying my report on the fur-seal fishery for 1895 (Senate Document 137, part II, Fifty-fourth Congress, plates 1-3) show the positions where seals were taken by 20 vessels sealing off the coasts of Japan and Russia during the past four years.

In my report on the Kuril Fur-Seal Islands, etc., this theme will be found elaborated further (p. 263).

LATITUDE IN THE PHENOMENA OF SEAL LIFE.

It can be safely said that most of the points in the life history of the fur-seal have been cleared up, in so far as they can be cleared up by direct observation, but the recent activity for information in this matter resulted also in a vast accumulation of misinformation gathered by and from persons either untrained in scientific methods, inexperienced in this particular subject, or prejudiced in favor of some pet theory, or biased by political considerations. This unnatural history of the fur-seal has caused doubts and confusion in the minds of those who have to trust to the literature for their information as to the truth of even some of the most easily observed and most firmly established facts. Renewed investigations have, therefore, become desirable.[1]

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[1] It should be noted that this was written prior to the investigations of 1896-97.

Aside from the mass of downright misinformation a good deal of harm has been done by the often too sweeping generalizations based upon a few isolated facts and caused by ignorance of the true relations of the latter as exceptions and not as rules.

It must not for one moment be imagined that the lines are as tightly drawn in nature as in many books and reports. It will probably be possible to cite more or less isolated occurrences contrary to nearly every habit of the seals as generally outlined. These exceptions are not frequent enough nor important enough to affect the general result, and it may be confidently asserted that the investigations which have of late been carried on by the American Bering Sea Commission of 1891 and quite recently by the United States Fish Commission have brought out correctly the main facts relating to the life-history of the seals.

We have frequently seen, however, that the various exceptions alluded to have been brought forward in the controversies relating to this theme as particularly essential, thus obscuring the main questions, while on the other hand conditions have been described and depicted as so uniform and stable that it has been easy for the opposite side to controvert these assertions, thus throwing doubt upon the correctness of the whole argument and the soundness of the conclusions. It may be useful, therefore, to review a few of these questions.

A protracted stay at the rookeries reveals two facts. The one which probably first impresses the observer is the curious stability of the general outline of the groups of breeding seals, especially if the comparisons be made at frequent intervals during the earlier part of the season. The masses of seals assume certain definite shapes which in many cases have no apparent relation to the nature of the ground upon which they are lying. Thus, on the North Reef Rookery on Bering Island, a very peculiar feature of the distribution of the breeding seals this summer was a narrow band of seals which extended obliquely across the northern end of the "parade grounds," cutting off from the latter a small oval portion, visible in most of the photographs (pls. 19, 21, 22) and also indicated in the map (pl. 8), and connecting the masses of seals on the western side of the reef with those on the eastern side. I have walked over the territory thus curiously occupied many a time, but I have failed to find any difference in the ground which will account for this belt or answer the question why the seals do not also occupy the bare oval island it surrounds.

To appreciate this *general* stability of the outline it is necessary to have had an opportunity to observe the rookery for some length of time. A person who had only a few days at his disposal for examining the same rookery might, on the other hand, be impressed by the fact that on two different days, or at different hours of the same day, the outlines thus referred to present entirely different aspects, and if he offered photographs in evidence of this fact he might seemingly prove the instability of these lines. Thus the "band" of seals on the North Reef Rookery above alluded to did occasionally entirely disappear, particularly during the warmer portion of bright, sunny days, or after the rookery had been disturbed by a recent drive (see pl. 26).

Nevertheless this "band" was a very *characteristic* feature of the seals on that rookery. Single photographs are therefore of no particular value for comparison *from year to year unless they are taken by a person familiar with the characteristic distribution and the view is selected by him for that particular purpose.* The main reliance must, therefore, be placed upon the observer, and his statements must be received in accordance with his known experience, accuracy, and intelligence.

PROPORTIONATE NUMBER OF SEXES AND AGES ON ROOKERIES.

A question which of late has been given considerable prominence is that of the relative number of breeding females and old bulls on the rookeries. Upon this, and upon the closely connected one as to the number of females a bull is able to serve, there has been a great diversity of opinion.[1] My experience this summer leads me to the belief that, *on the whole*, a bull is able to take care of as many females as he can keep around him. There is undoubtedly great individual differences in this respect, some bulls being stronger than others, but I think it can be safely asserted, *as a rule*, that the procreative power of the bull is in direct proportion to his general physical strength. I think it also sound to assume that, *as a rule*, a bull physically strong enough to live through the winter gales and the vicissitudes of his winter wanderings and to return to his place on the rookery is also strong enough to fulfill his duty there. I have purposely emphasized "on the whole" and "as a rule," because I can easily imagine individual cases of, for instance, accidentally castrated bulls, or old feeble ones who might have the good fortune to meet with unusually favorable conditions during their winter migrations, etc., and because I am quite willing to admit that a number of such bulls may be found on each rookery. These exceptions, however, do not materially alter the above propositions as relating to the whole population of the rookery.

The train of reasoning which led me to the above conclusions is as follows: Some of the most noteworthy of my observations this summer on the Commander Islands establish the facts (1) that the decrease in the killable seals was most marked on Copper Island; (2) that there was a full complement of pups as compared with breeding females on both islands; (3) that there was an ample supply of bulls, old and young, on Copper Island, while on Bering Island they were much less numerous as compared with the number of females. I was informed that the latter condition was not peculiar to the present year (1895) alone, and it is also particularly mentioned in Mr. Grebnitski's report for 1893. It would therefore seem as if the different proportions between the sexes on the two islands have had no visible influence upon the number of pups born.

The soundness of the above deductions may receive corroboration, or the reverse, by observations on the south rookery on Bering Island in 1896. On that rookery the disproportion between the two sexes was excessive in 1895. According to reliable information the number of bulls on the whole rookery did not exceed five.[2] Judging from what I saw of this rookery during two visits, I should place the number of breeding females at about 600, possibly only 500. It would be a comparatively easy matter to observe this year whether the number of pups born be very markedly small in proportion to the number of females hauling out.

On the large rookeries it is difficult, if not impossible, for various reasons, to correctly estimate the average proportion between the bulls and the females, and particularly so on Bering Island, because the bachelors to so great an extent haul up between the breeding females. Mixed in among the latter in this way, it is next to impossible at long range to say, with any approach to accuracy, what the proportion between these two classes is.[1] In general, the difficulty lies in the fact that the individual harems differ so greatly in size. Thus, during the visit to Kishotchnaya rookery, Bering Island, on July 9, Mr. Grebnitski counted several harems which contained all the way from 12 to 93 females, or more. But there is still another serious difficulty, which is due to the constant going and coming of the females, so that the number of females in the individual harem fluctuates between 0 and the maximum, according to the time of day or condition of weather. Thus, on the 16th of July, on the same rookery, I counted a harem having 16 females, which upon a recount a few hours later, contained 23, "while some of the other bulls were entirely deserted."[2]

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[1] While maintaining that the value of the guesses as to the number of females a bull is able to serve is of necessity very dubious, I may mention that Mr. Kluge, who for eight years spent the summer upon Tiuleni Island with the seals practically under his very eyes the whole season, informed me this summer that "he does not for a moment believe that twenty-five females to a bull are in the least too many," though he did not venture to guess at the maximum.

[2] When I visited the rookery on August 17 the bulls had already left. It was rumored in the village that there had only been one bull, but Nikanor Grigorief, the native in charge of the killing there, informed me that the actual number was five.

I have above alluded to the difficulty of discriminating at a great distance between the females and the killable bachelors when mixed on the breeding ground. The difficulty is not confined to these two classes alone. The experts profess to be able to separate the bachelors into yearlings, 2-year-olds, 3-year-olds, 4-year-olds, and 5-year-olds, and in the descriptions and discussions we find these classes mentioned in such a way as to lead to the impression that they are easily recognized on the rookery or the killing ground, but nothing can be further from the facts. With hundreds of dead seals before me, I have been unable to draw any line between the various ages, nor has anybody present been able to point them out to me.

I have submitted elsewhere in this report a series of weights of skins (p. 109) which shows beyond a question that there is an unbroken series of all sizes from the smallest to the largest. The whole question resolves itself into a mental sorting of the killable seals into a number of classes, calling the smallest 2-year-olds, the largest 5-years-olds, and roughly distributing those in between among their respective classes. The yearlings, however, form a fairly well-marked class by themselves, as do, of course, the bulls—features not apparent in the tables of skin weights alluded to, from the fact that these classes are not killed.

The fact that even the natives are not always able to tell the females from the bachelors on the rookeries was curiously proven to me one day at Glinka, Copper Island, when Aleksander Zaikof and the chief, Sergei Sushkof, had a somewhat heated controversy over the question whether a certain body of seals on the Urili Kamen rookery consisted of bachelors or females. Both of the men are among the most experienced and intelligent on the island. Yet it was only because Sushkof had been stationed the whole season at Glinka, while Zaikof only arrived with us the day previous, that he was regarded to be in the right.

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[1] It is held by some that the natives have such a marvelously keen eye and discriminating power as to enable them, at least, to make such an estimate. At one time I accepted this as a matter of faith, but my experience last summer—to be detailed further on—has convinced me that the natives are not particularly gifted in that respect. As a matter of fact, their estimates are about as much guesswork as that of the white people, only that from their greater familiarity with the ground and the seals, they are apt to guess more closely.

[2] The number of animals and the proportion of the sexes on North rookery, Bering Island, during July, 1893, as quoted by Dr. Slunin (Promysl. Bog. Kam. Sakh. Komand., p. 9), from the official journal of the overseer (*offitsialni dnernik nadziratelia*) are worse than useless. The numeration by the overseer in question is the worst kind of guesswork, if not entirely fictitious. Dr. Slunin's remark that the conclusions to be made from those figures would be strange (*stranni*) is certainly appropriate.

But even at closer range it is sometimes difficult to distinguish the sexes. On the killing ground, where the teeth of the seals are easily seen, there is, of course, no special difficulty, and mistakes are seldom made; not so in the drives, however.

During a small drive at Glinka, Copper Island, August 8, 1895, about 300 seals were made to cross the mountain pass (about 800 feet) in three main divisions, no less than 30 grown men taking part in the driving. Halfway up one of the men declared that there was a "matka" in the drive. It was questioned, but upon closer scrutiny he was found to be right. It was not until the final sorting before the killing took place that several females were discovered in the flock.

As an additional indication of the lack of definition of the different classes of seals as expressed in their sizes, I append a few tables of measurements taken from the freshly killed animals.

Measurements (in millimeters) of fur-seals (Callotaria ursina), Bering Island, north rookery, July 30, 1882.

No.	Sex.	Total length.	Fore legs.	Hind legs.	Girth behind fore legs.	Nose to eye.	Nose to ear.	No.	Sex.	Total length.	Fore legs.	Hind legs.	Girth behind fore legs.	Nose to eye.	Nose to ear.
1	Male	1780	495	555	910	105	212	12	Male	1250	360	400	780	82	165
2	do	1660	465	475	920	95	205	13	do	1205	325	410	775	82	175
3	do	1560	480	495	880	95	180	14	do	1200	292	380	700	75	165
4	do	1550	390	490	890	92	204	15	do	1185	300	385	750	68	152
5	do	1430	430	465	790	83	175	16	do	1180	330	415	810	85	180
6	do	1390	390	470	860	85	180	17	do	1170	345	400	750	83	166
7	do	1380	400	455	795	85	175	18	do	1140	315	395	700	75	165
8	do	1345	360	455	800	90	175	19	do	1125	350	385	730	85	184
9	do	1340	370	440	820	90	180	20	do	1100	300	355	710	75	168
10	do	1350	360	440	870	82	185	21	do	1035	255	340	620	73	155
11	do	1260	405	450	710	85	183								

Measurements (in millimeters) of specimens of fur-seals collected for United States National Museum at North Rookery, Bering Island, August 20, 1883.

	No. 2519 male.	No. 2520 male.	No. 2521 female.	No. 2522 male.	No. 2523 male.	No. 2524 male.	No. 2525 male.	No. 2526 female.	No. 2527 pup.	No. 2528 pup.	No. 2529 pup.
Total length	1495	1930	1283	1495	1475	1285	1085	1025	800	800	785
From nose to end of outstretched hind feet	2505	2450	1650	1935	1935	1655	1390	1255	1040	1030	965
From nose to armpit	1125	980	085	780	775	660	605	520	410	427	375
From nose to eye	110	98	67	78	90	80	72	60	55	59	52
From nose to ear	214	213	168	183	173	158	154	148	120	120	111
Distance between eyes	98	104	70	83	72	71	70	70	59	55	54
Distance between ears	183	173	138	150	140	138	120	125	99	104	98
Length of ear	52	52	45	53	53	47	39	46	38	42	32
Length of longest mustache bristle	195	113	125	185	177	105	95	87	70	67	66
Length of fore limb	530	540	345	500	515	395	300	305	255	268	220
Width of fore foot	215	223	123	160	165	125	107	117	100	99	85
Length of hind limb	615	597	415	485	507	420	350	295	216	275	210
Width of hind foot at tarsus	130	135	95	112	113	85	80	70	65	67	60
Width of hind foot at end of toes	250	285	170	245	202	177	160	155	135	138	125
Average length of toe flaps	230	230	162	190	196	161	115	102	88	85	68
Length of tail	55	50	53	55	55	47	46	57	25	29	29
Distance between tips of outstretched fore limbs	1770	1740	1205	1445	1370	1085	960	855	705	720	650
Girth of neck behind the ears	580	598	405	475	470	405	360	355	330	332	404
Girth over the shoulders	1150	1205	750	950	930	820	680	600	455	480	465
Girth behind fore limbs	1260	1155	780	850	790	740	625	565	450	425	445
Girth in front of hind limbs	475	480	280	380	365	295	245	225	197	195	168

Measurements of two gray pups, taken at north rookery, Bering Island, October 26, 1882.

	No. 1697. Male, 38 pounds.	No. 1696. Female, 30 pounds.
	Mm.	*Mm.*
Tip of nose to end of tail	885	865
Tip of nose to fore flippers	425	375
Fore flippers	295	263
Hind legs	275	243
Tip of nose to eye	55	42
Tail	27	20
Girth behind fore flippers	630	570
Ear	38	35

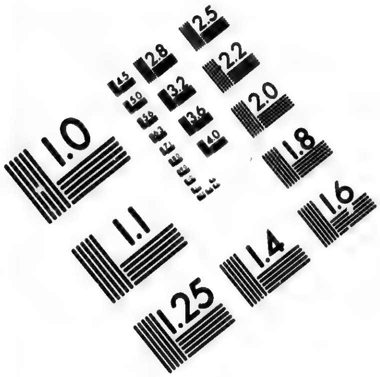
VIRILITY OF BULLS.

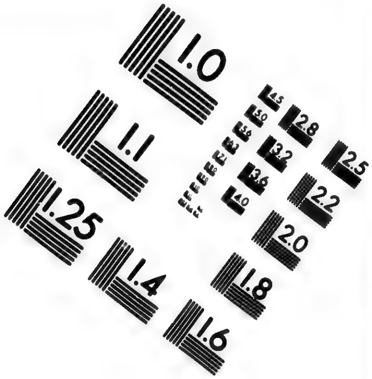
While there is thus shown to be a certain instability in the rookery outlines and quite an uncertainty as to the various classes and stages of the seals, except in a *general* way, there is observable a similar lack of strict adherence to the habits as described by many writers, though these may upon the whole be correct. No doubt, for instance, many of the old bulls on the rookery, especially early in the season, stand up bravely without retreating, even against a number of men, but it is also true that a good many of them do not. Lest the more cowardly conduct of some bulls should be charged to an alleged lack of vitality in those of the present generation, I will only quote what I wrote immediately after my visit to the North Reef Rookery, Bering Island, on June 5, 1883:

> Between 200 and 300 old bulls were scattered all over the ground, some sleeping, some fighting; others rose up, somewhat uneasy at our approach; others, again, galloped away as fast as their short feet would carry them, plunging headlong into the water. A few would make a bold stand for some moments and roar at us, but they soon turned, seeking to escape. None of those we approached very closely would keep their position.

I may cite another instance from a date much later in the season, but yet at a time when the females required the full attention of the bulls and on a rookery where the latter were plentiful and vigorous. The observation was made in Sikatchinskaya Bay, Palata rookery, Copper Island. Mr. Grebnitski had landed on a rock in the rookery to take a couple of photographs, while I, with the men, remained in the boat. The following is an abstract from my dairy of August 3, 1895:

> It was a sight never to be forgotten. The females from all around rushed into the water pell mell, while the old bulls were running to and fro trying to keep them back, though in some cases taking the panic themselves and following the example of the females, who made the water fairly boil around the boat by their jumping. On the nearest rocks hundreds of black pups were huddled together as close as they could stand, fearing to go into deep water; but finally driven into it by the advance of the photographing party, they swam with the utmost ease. Of all the many seals covering the rocks around us when we first arrived, only two kept their places. These were an old bull and a matka in heat. Our boat was lying within 20 feet of them, yet they did not mind us, and the courting—the female did the courting—went on, although our presence evidently acted somewhat depressingly on the male, who anxiously kept an eye upon us, while yet unwilling to leave the female. Occasionally he screwed up enough courage to face us and roar defiantly, but as we approached to within 10 feet and I got up in the boat to fire my camera at him, he suddenly thought that discretion is the better part of valor, and plumped headlong into the water on the other side of the rock. He came out and up on the rock, however, a few minutes later and shook the water out of his fur, but the female had apparently become disgusted with him, for, in spite of our retreating, she went into the water shortly after he had returned to her. He then also left for good.





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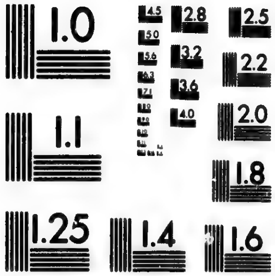

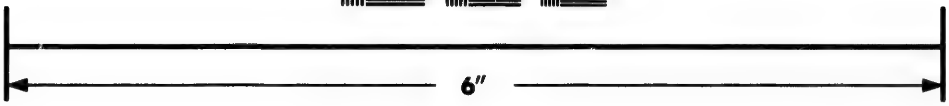

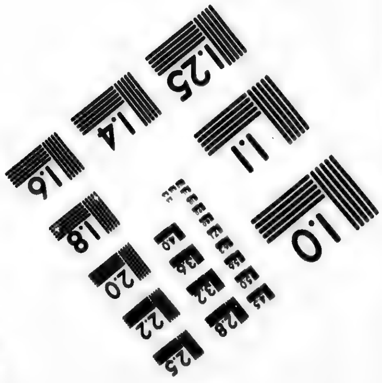

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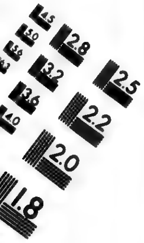
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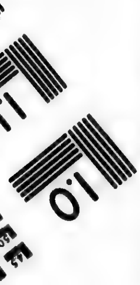
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DO ALL BACHELORS HAUL OUT?

The general impression, as derived both from the printed reports and oral communications, seems to be that the vast majority, if not all, of the bachelors haul out on the beaches during the season. It would, of course, be impossible to say whether each individual bachelor does haul out at least once during the season, or whether some of them stay in the water throughout the entire year, but my observations lead me to believe that only a smaller portion of the whole body of bachelors haul out *at any one time*. That a good many of the seals in the water in the immediate neighborhood of the rookeries are bachelors, I know from personal observation, for the two sexes are more easily distinguished at a distance while in the water than on the rocks. These probably all haul out at some time or another. But the question is, does the bulk of the bachelors met with on the feeding-grounds and far away from the rookeries during the breeding season also haul out? I am inclined to believe that they do not, for the following reason:

While it is true that the great rookery on Bering Island was never before "raked and scraped" for the last bachelor seal as it has been during the past seasons, yet it is not denied that a similar difficulty in gathering the requisite number of killables has been going on for a couple of years, though not to the same extent. Now, if intelligent and honest persons, at the close of the season of 1894, had been asked, while viewing that rookery, whether there were, say, 18,000 bachelor seals (outside the pups of that year) in sight or within a comparatively short distance, they would be obliged to answer no. The question then becomes pertinent: Whence, then, came the 9,000 bachelors killed in 1895 on that rookery (hardly any yearlings showed up at all) and the probable other 9,000 that perished during the winter by being killed by the pelagic sealers or otherwise? The bulk of these 18,000 must have stayed away from the immediate neighborhood of the island, and as bachelor seals are not known to haul out in great bodies very far from the breeding grounds, there is every reason to conclude that they stayed at sea.

Mutatis mutandis, the same question might have been asked in 1896. There were not enough bachelors left in 1895 near the rookery to furnish 500 additional skins. Whence, then, came the 6,000 bachelors, and good-sized ones at that, killed at the north rookery in 1896?

It might be said that, as the bachelors which have hauled out do not stay ashore during the entire season, but go off to sea and return time and again, the whole reserve supply of bachelors may have been in the water in the neighborhood. But that explanation does not hold so far as the Commander Islands, at least, are concerned, for two reasons: First, because the natives were on the watch all the time for the appearance of even the smallest band of bachelors. Toward the end of the season no drive was despised, however small, and few indeed were the bachelors which they suffered to escape back into the sea; second, because there would be a larger proportion of bachelors in the pelagic catch on the feeding grounds, the small percentage suggesting pretty plainly that the nonhauling bachelors remain away from the neighborhood of the islands.

To fully understand the question it is necessary to remember that the bachelor seals, especially the younger classes, have no functions to perform on land during the breeding season. I do not believe that a single good reason can be advanced in defense of a proposition that the hauling out of the bachelor is of any advantage *to* *the individual.* Nor does it seem probable that all the bachelor seals are subject to a very *pressing* desire to go ashore until the sexual instinct is awakened. The hauling out on dry land by any immature seal is, therefore, only the result of the habit having been inherited. It is therefore likely to be of very varied intensity, and there is nothing intrinsically improbable in admitting that this habit in some, or even in many, is only awakened at the approach of sexual maturity. It must, furthermore, be borne in mind that the bachelor seals require an abundance of food no less than the females. The *nursing* of the young makes it imperative for the latter to visit the distant feeding grounds, and also to return regularly to the rookery. The bachelor seal, on the other hand, in contradistinction to the old fat bulls remaining the entire season on the rookery, needs a big food supply because he is *growing;* but, different from the female, he has no individual business on the rookery. Of course, while there is no advantage to the individual bachelor in hauling out, there is an advantage to the species, inasmuch as it tends to strengthen the inherited habit which insures the return of the necessary number of breeding males at a later age to their respective rookeries, but this proposition does not involve any necessity for *all* to do so.

The above observations and reflections, which are chiefly submitted in order to emphasize that it is necessary to allow for a certain latitude in the habits of the seals, I am now going to follow up with a series of special observations upon certain phases of fur-seal life which I made during the investigations of last summer. They are in part corroborative of observations made by investigators in other localities, particularly the Pribilof Islands, while, in part, opposed to the opinions held by some other observers. In so far as this diversity of opinion affects certain theories only, my deductions will stand or fall upon their own logic; but where there is a disagreement as to the facts I beg to remind my readers that the facts, as here set forth, only relate to the conditions found on the Commander Islands, and more particularly on Bering Island. If the facts observed by me differ from those established by others, it does not necessarily follow that one of the two observations is erroneous. I will again recall the fact of the bachelors mixing among the females and the consequent driving of the latter on Bering Island in order to show that there are differences between the conditions there and upon the Pribilof Islands. These differences have been treated of in a separate chapter (p. 218).

FOOD OF SEALS AT THE ISLANDS AND EXCREMENTS ON THE ROOKERIES.

The question as to what animals furnish the bulk of the food of the fur-seals can not be solved positively on the rookeries. My investigations last summer corroborated those of twelve and thirteen years ago and tally with those of others, viz, empty stomachs with a few stones in them, and occasionally a few beaks of cephalopods, or very rarely the backbone of some unlucky fish. Since, however, as I have already pointed out, the bachelor seals on account of their growth must necessarily take a great deal of food during the summer, the above negative result does prove pretty positively that the seals on the Commander Islands must, *as a rule*, obtain their food so far from the islands that it is thoroughly digested before they return to the hauling grounds.[1]

I emphasize again the "as a rule," because there are single observations to the contrary. Thus, I was informed on Bering Island that once on the south rookery a flock of bachelors was so full of octopods[1] that they vomited up quantities of these mollusks while being driven.

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[1] The food and feeding of the seals are treated at length in Part III.

It is true the statement that the bachelor seals must necessarily feed because they are in a stage of continued growth is a purely theoretical one, and it has been seriously denied that they feed during the season to any much greater extent than the old bulls. In support of this contention is quoted the observation by the British Bering Sea Commissioners (Rep. Brit. Comm., p. 42) as to the absence of excrementitious matter upon the rookeries. Though my observations, more particularly on the Commander Islands, do not agree with theirs, or Bryant's, I am not going to dispute their accuracy on that account, but I do maintain that their negative result does not prove anything, while my positive observations to the contrary do prove that the seals take nourishment throughout the season. And now for my facts.

Anyone examining the carcasses on the killing grounds immediately after the killing can not help observing that a good many of the dead seals at the moment they were slain had voided a greater or less quantity of ocher-yellow excrement of a creamy consistency. This observation I have not only made on the Commander Islands at every killing I have there witnessed (and the unpleasantness of handling the seals thus soiled has very vividly impressed my mind), but also on St. Paul Island during the only drive it was my privilege to follow there, viz, on June 26, 1895. Here is the entry relating to the latter observation :

> Mr. True afterwards opened a number of stomachs without finding any food in them, and I opened one, which had just voided a quantity of fluid excrement, with similar result. Quite a number of seals voided excrement of like nature.

On the 2d of August, 1895, Mr. Grebnitski and I landed and established our camp at Babinski Padjom, Glinka rookery, Copper Island, on the former hauling ground of the bachelors. A few half-bulls only were located at the eastern end of the bay, all that was now left of this rookery. Here are the words of the diary :

> After supper I went over to the eastern end of the bay, where the polusikatchi above alluded to had been lying (for upon our settling down in their neighborhood all of them sought safety in the sea). The entire narrow and steep beach which lines the precipitous cliffs (300 feet and more), forming the coast here consists of rounded stones of various sizes, from that of a marble to that of a man's head, but averaging perhaps that of a fist, and of a light-gray color. On this pearl-gray ground the station of each half-bull was clearly marked with a brown stain, and all around patches of semifluid excrements were found in various stages of drying up and disintegration. The freshest excrements were of a blackish-brown color and of a very penetrating and disagreeable odor, while the dried ones were of a pale drab color. In spite of the humidity of the climate things on the beaches dry up remarkably fast and thoroughly, but I suppose it is partly due to the perfect drainage of the sandy or pebbly beaches. * * * The fact is that the excrements contain comparatively few solids and are easily dissipated.

This observation is particularly conclusive because it showed at the well-defined station of each half bull (hauling up much after the fashion of the old bulls) a quantity of fecal matter in the various stages of disintegration, from that of the semifluid, nearly fresh excrement to the dry and odorless "chip." Taken as late as August 2, yet a considerable time before the close of the season, it has a very important bearing upon the question.

The third and last entry in my diary in regard to this matter is dated August 22, and relates to what took place during the big drive on that date on the North Reef rookery, Bering Island, which was witnessed by the officers, including the surgeon, Dr. Lloyd Thomas, of Her British Majesty's ship *Porpoise*. It reads as follows:

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[1] More probably squids; decapods.

> There was another matter to which I called the special attention of the English gentlemen while we were on the rookery, viz, the presence—and very offensively smelling presence—of semifluid excrements on the rocks, particularly mentioning the opposite observation of the British commissioners. In fact, the fecal matter was making it very slippery in places.

The argument derived from the alleged absence of excrementitious matter on the rookeries is consequently disposed of. It may be well to add the remark that it is more than probable that most of the feces are voided at sea before hauling up, and that, in conjunction with their fluid nature, this explanation accounts satisfactorily for the fact that its presence on the rookeries is not more obvious.

As already remarked above, observations on the rookeries are not apt to furnish positive data as to the nature of the bulk of the food of the Commander Islands fur seals. That they eat cephalopods is proven by the occasional presence of the beaks in their stomachs, as well as by the above-quoted instance on the South rookery (p. 69). It is also possible that Mr. Grebnitski's suggestion is correct, that the presence of pebbles in the stomachs is largely to be accounted for by assuming that they are swallowed together with the octopods holding onto them.[1] That they also eat fish, at least occasionally, is also unquestionable. But the following facts will as unquestionably show that salmon and cod, at least, do not furnish any portion of the *regular summer* diet of the Commander Islands seals worth mentioning:

It may not be very much to the point to observe that three species of salmon (*Oncorhynchus*) abound in all the rivers on Bering Island, and that the fur seals are not observed to feed upon them at the mouths of these rivers; but the fact that the largest salmon river of the island, the Saranna River, is situated less than 7 miles from the largest seal rookery without the seals coming over there to feed upon the enormous numbers of salmon ascending that river is proof conclusive. The river and the fishing establishment of the natives at Saranna have been described elsewhere in this report, so that it will suffice in the present connection to recall the statement that the annual catch in that river alone varies between 20,000 and 100,000 salmon.

As for the codfish, it is only necessary to state that they are common right off the great north rookery of Bering Island. On September 16, 1895, we were anchored in 10 fathoms of water less than a mile from Sivutchi Kamen and within hearing of the roar from the rookery. A single cod line over the side of the steamer for a couple of hours brought up three-fourths of a barrel of codfish.

EFFECT OF DRIVING.

One of the questions to which I paid special attention during the past summer was that of the effect of driving upon the vitality of the seals. It has been variously asserted that the repeated driving of the male seals on the Pribilof Islands has resulted in the weakening of the procreative power of the bulls, and the consequent degeneration and partial decrease in the number of seals on the rookeries. It has also been hinted that the difference in the methods of driving the seals on the Pribilofs and on the Commander Islands might account for the apparent lesser diminution of the seals on the latter islands. The question is therefore one of the utmost importance, and it was in order to specially make a direct comparison between the methods employed on the American and the Russian side that I asked to be enabled to land on St. Paul Island and witness a drive there before proceeding to the Commander Islands. It is therefore pertinent to submit a description of this drive, which, thanks to the assistance of the agents of the company and of the United States Treasury, I had an opportunity to follow on June 26, 1895.

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[1] Shown to be incorrect. The cephalops eaten by the fur seals are species found in deep water and not far from the surface.

It would, of course, be hazardous to base any far-reaching conclusions upon one single drive. As Mr. F. W. True was going to follow up similar studies on St. Paul Island during the whole of the following season, he kindly assented to accompany me on the present occasion, so that he might afterwards inform me how the drive we were going to take part in might compare for severity with those which were to follow later, and which I myself would not be able to inspect.

At 9 p. m. on June 25, in company with Mr. Stanley-Brown, the general agent of the company, we started for Polovina rookery in a buckboard drawn by a pair of strong mules. The road was to a great extent still covered with snow and water, compelling the driver to pick his way in the dark over hills and marshes. After a trying ride of two hours, during which it was a wonder that we were not upset and spilled by the roadside or into the water which surrounded us on all sides, we arrived safely at the hut, where we found a party of nine Aleuts who had preceded us. After a fitful slumber on the benches in front of the cooking stove, we turned out with our gang at 2 o'clock the next morning and proceeded to the hauling ground, where we could hardly discern the various objects in the hazy gray light of the early morning. I quote now from my diary, written a few hours later:

> We move stealthily along the margin of the breeding ground, which is occupied by angrily bellowing bulls, a few—a very few—females, and still fewer pups, cutting off a small herd of bachelor seals that are skirting the inner edge of the breeding grounds. At the end of the latter we make a sudden spurt, Mr. True and I running at full speed with the Aleuts for the water's edge, thus cutting off another crowd of bachelors—I estimate in all about 1,000. Then the driving begins by dividing the herd in two (unintentionally) uneven sections, which are driven easily, without special urging, over very even ground.
>
> The seals are of very unequal sizes, there being quite a number of large half bulls in the flock. In driving, the various sizes become somewhat sorted, inasmuch as the younger and more agile seals keep well to the front, while the large and fat half bulls bring up the rear. Occasionally a few of these are cut out and left behind—probably in all about 50. No other cutting out or culling is undertaken while the driving is going on, and is practically impossible as long as the seals are driven in as large flocks as these. On the other hand, the driving gang is too shorthanded to manage a large number of small sections, as on the Commander Islands. After a moderate drive overland for about three-quarters of an hour, the seals enter a series of shallow lakes, and now the progress is rapid. At 5 a. m. the herd is halted just outside the salt house at Rocky Point, and the drive is over.
>
> It is noticeable that the seals are nearly as fresh at the end of the drive as at the beginning. The younger seals are quite active; they walk about unconcernedly, and stand well up on their legs, while the big ones commence to fight each other immediately upon the halt being made. Only one single seal dropped voluntarily out of the line on the road, viz, a large and particularly fat half bull that got tired very early.
>
> The killing gang arrived from the village in two boats a little after 7 a. m. Six men with nicely finished hickory clubs did the killing while the others were skinning. Mr. True and I took the tally of each of the first ten "pods" of seals as they were separated off from the big herd to be killed. These "pods" consisted of from 15 to 40 seals, averaging about 25. Of these the killing gang clubbed to death those which appeared to come within the required size; the others, being either too large or too small, were allowed to escape to the beach close by. About 50 per cent were thus turned away, about one-half consisting of too small seals, the other half of too large ones. The killing was over at 10.30 a. m., about 500 skins having been secured. It is to be noted that no female was observed among the seals driven.

On the whole the affair was conducted with care, although a certain hurry in order to get through as soon as possible was quite manifest. This haste, probably due to a desire to be back in the distant village before dinner, was responsible for the less deliberate way in which the "pods" to be killed were cut out from the main herd. This resulted in great worry and consequent heating of the remaining seals, which made it necessary to drive them repeatedly into the ice cold waters of an adjacent pond in order to cool them off. This necessity was rather startling in view of the chilliness of the atmosphere and the long rest enjoyed by the seals between the drive and the killing.

Apart from its length—about 2 miles—this drive must be characterized as very easy. An inspection of the ground over which the drives from some of the other rookeries must travel impressed me, however, with the fact that not all the seals on St. Paul Island are let off as easily. Mr. True also informs me that this impression is correct, and that the drive we witnessed in company was rather easier than the average.

I will now submit a description of a few characteristic drives observed by me on the Commander Islands. The first one (which took place during the palmy days of the business on these islands) occurred on July 13, 1883. A thousand seals were to be taken from the Pestshani hauling grounds (p. 63), Glinka, Copper Island, to finish up the catch of the season.

We started out at 4 o'clock in the morning from Glinka village. The weather was very disagreeable. A wet, gray fog concealed everything, preventing us from seeing 20 paces ahead. The thermometer indicated +43° F. The path, which in two places rises to over 800 feet above the sea, with a drop of 500 feet and another rise of nearly 200 feet between them, was slippery in the extreme, as the protracted rain had softened the clayey ground. After a very tiresome walk of nearly an hour we halted on top of a third hill, where we had a pretty good view of Pestshani hauling ground, as the fog had lifted somewhat by this time. The projecting point of the beach, so named, was densely covered by a black mass of bachelor seals, which here haul out by themselves in large numbers apart from the breeding ground. When the last of the gang of about 20 men had arrived the line of action was decided upon, the chief assigning to each man his duty, and the whole crowd ran or slid down the steep grassy descent about 700 feet in one continuous slope.

We approached the compact mass of bachelors rapidly. The nearest animals showed signs of uneasiness upon our coming within 50 feet of them. The chief then ordered "Go ahead," and we all made a rush to cut the big herd off from the sea. Those located near the water's edge were successfully intimidated along the whole line and prevented from seeking safety in the sea; they fell back upon those behind, thus effectually barring them, and soon the whole mass was surrounded and slowly moving away from the water until stopped by the precipitous walls of the coast escarpment. The flock thus secured consisted of about 2,000 bachelor seals of various ages. As rigorous orders had been received not to accept skins under 8 pounds, the sorting would have to be very careful, hence the necessity of a large number to select from.

The whole regiment of seals were now divided into companies, which were driven slowly along the escarpment to the steps built of driftwood (see fig. *b*, pl. 58). These were ascended with but little difficulty. Altogether, ten companies were formed, each driven by two men. A space of several hundred yards was allowed between each section (pl. 77).

The progress was slow, averaging less than a mile an hour. There was consequently good opportunity to sort out any undesirable seals. Thus a number of undersized youngsters were allowed to escape early in the drive. Before ascending the 700-foot slope mentioned above, a halt was made. Soon, however, the climbing began. As may well be imagined, the ascent was very laborious. The angle of the slope was at least 35 to 40 degrees, and the smooth grass and slippery clay made it almost impossible to get a hold with the feet. The poor animals slid backward over and over again, and when they finally succeeded the ground was made smoother and more difficult for those to follow. Moaning, and blowing, and steaming, they press their smooth fore-flippers hard on the elusive clay, and drag the hind part of the body after, while the men beat the ground with their long staves in order to stimulate the animals to further effort. It happens rather frequently that a seal loses his balance, and after a series of bounding somersaults lands at the foot of the hill, accompanied by the

> laughter and meriment of the Aleuts. I expected every time to see it lie dead with broken back or neck, but every time the involuntary acrobat arose unhurt, looked around in a dazed manner, as if surprised at finding himself so suddenly alone, away from his comrades and tormentors, and scampered away as fast as possible toward the sea.
>
> About halfway up the hill even the larger seals commenced to give out and refused to move farther, from sheer exhaustion. As it would not do to leave these behind, a knock with a club on the head finished their unhappy existence. In a minute or a minute and a half, the skin had been ripped off from the quivering body and thrown into the knapsack which each man carried on his back. Having arrived at the top, the survivors were given a long rest. The remaining 2 miles of the march were easier, though the last ascent was hard enough on account of the tired condition of the animals. An hour of rest was given before the final killing, to allow the animals to cool off.

This drive can easily be traced on the map (pl. 101), as it followed the dotted line between the Pestshani hauling ground and Glinka village.

With slight modifications the above description applies to most of the drives on Copper Island during the days of plenty, though the present one was one of the hardest, as it was the longest. A shorter route was afterwards devised, as detailed under the description of the Glinka rookeries (p. 65). Of late years there has not always been enough animals to make it worth while to drive them from Palata over the 1,000-foot pass, and many of the small drives are killed not far from the beach, and the skins carried in knapsacks across the mountains to the salt houses on the other side of the island. At Karabelni the carcasses were even skinned right on the beach, not 1,200 yards from the breeding grounds, so that the waves carried them out to sea and occasionally threw them up again on the rookery among the living seals. However, even nowadays the seals are driven across the island every time their meat is wanted for food, or whenever the drive consists of so many seals that it is practically impossible for the people to carry all the skins on their backs, as testified by the 700 decaying corpses on the killing ground at Pestshani salt house, which I photographed on August 6, 1895 (pl. 58*c*).

To complete the picture of the driving on Copper Island, I may describe one of these small drives, the principal object of which was to obtain fresh meat for the natives. It is thus recorded in my diary for August 8, 1895 (pl. 58*a*):

> The weather was just right for ducks and fur seals, and consequently we started out this morning at 6 a. m. in a drizzling rain. There was no help for it. The drive could not be postponed, and as I was going to photograph, rain or no rain, the cameras were taken along. The weather might possibly be better on the other side of the mountains, but it wasn't.
>
> As indicated yesterday, all the rookeries had to be scraped in order to make even a small drive, and since I could only be in one place at a time, I selected to go with the party taking the drive at Zapadni. Here altogether about 250 animals were finally gathered together, and the driving started in three divisions. This could easily be done, for there were certainly enough people to attend to each division, there being no less than 30 full-grown men and about half a dozen boys. What a difference from former days, when 2 men or boys were all that could be spared for divisions of about 200 seals each! Most of the animals were killable bachelors, a few females and undersized bachelors having been separated out, as the drive went on, before the steep ascent was reached. Thus far I have only with certainty discovered one female driven across the mountain.
>
> The road was very wet and slippery, both from the long grass and the smooth clay which here forms the chief material covering the underlying rock, and the ascent was consequently a very laborious one. The middle part of it is very steep, and in one place steps have been cut in the ground so as to facilitate the climbing. The altitude of the pass forming the highest point on this drive is about 800′.
>
> The seals soon commenced to give out, and the men then resorted to all sorts of goading them on, short of killing, in order to get as many of the seals as possible alive to the killing ground at the village, since they wanted the meat badly. Only when a seal could absolutely go no farther, after having

been urged on by being poked and beaten with the sticks, only then it was killed and skinned. But not even then in all cases, for if it was a small and therefore particularly tender animal, it was grabbed by the hind legs and dragged along [pl. 62*a*] until some steep declivity was reached, down which it was then flung. Yet a good many had to be killed along the road. Little girls and still smaller boys arrived now with big skin bags on their backs [pl. 62*b*] to carry home the skins and choice parts of the meat. The last division, as well as about one hundred seals from Palata Rookery, reached the level ground behind Glinka village at 10 a. m. and were given a rest there.

At 11 o'clock the final drive in four divisions was begun toward the killing ground near the beach (not 300 yards) west of the village [pl. 78]. Down the steep embankment (fully 60 feet high) the numerous drives have worn a deep channel-like rut in the slippery clay, and down this chute the animals came rushing as if it were a toboggan slide [pl. 63*b*]. They slid down in bunches together, and became piled up at the bottom in big heaps. As they were now driven over the sand of the beach, a few undersized seals and a solitary matka or two were sorted out and allowed to escape into the water, but the final culling was done on the killing ground. Altogether 47 undersized animals were thus driven over the mountains and finally permitted to go back into the sea.

These young animals let loose on the sandy beach afforded great sport for the younger generation of future seal killers, if seals there be left when they grow up. Four little tots, five to six years old, with sticks in their hands, tried to drive into the water two young seals too tired to advance farther and asking nothing but to be allowed to lie down and rest. The seals resented the attack, and the four little fellows hit them over the head and the snouts with their sticks, as they had seen their parents do with the big ones, and finally succeeded in driving them into the sea.[1]

The above descriptions give a fair idea of drives on Copper Island as they were and as they are. They demonstrate the tremendous difficulties and the hardships on the seals. A glance at the maps of the Copper Island rookeries and a study of the descriptions I have given of them in another chapter must convince anybody that there is nothing even approaching them on the Pribilofs.

Not so on Bering Island. There the drives are short and easy on the seals. The killing ground is located scarcely more than 500 yards from the main rookery, and right in front of the summer village where the men live during the sealing season. The longest drive ever taken is only 1½ miles long; the road is over level ground, mostly covered with grass, and the ascent up the coast escarpment is easy and only 30 feet high.

A grave feature of the Bering Island drives, however, consists in the mixing in of females and pups with the bachelors throughout the season. I have elsewhere in this report treated of this side in detail, but it may not be superfluous to give an account of one of the largest drives last summer on North Reef rookery, Bering Island, which took place August 22.

It being necessary to wait for low water, we did not start until 7 o'clock a. m. The morning was raw (about + 50° F.) and dark, a drizzling fog enveloping the scene and making successful snap-shot photography an impossibility. We proceeded, Indian file, to the rookery and in short order drove off nearly all the grown seals located on the reef itself, over 4,000 animals all told. Most of these were females (about 3,000) and bachelors (about 1,000). As it was late in the season only 8 bulls were caught. As many pups as possible were allowed to escape into the sea, and they availed themselves of the opportunity offered to go off in large flocks. Nevertheless, about

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[1] I am sorry to say that a good deal of unnecessary suffering was caused the animals simply for the fun of it. The people can hardly be blamed. They are certainly not particularly cruel by nature, but on the other hand they evidently have no idea of such a thing as cruelty to animals. They have grown up from babyhood among these scenes, and their feelings are naturally blunted. It must not be forgotten, however, that in the midst of our own civilization more cruelty to animals is practiced in a single day than in a whole season on the seal islands.

300 pups were driven off to the killing grounds before they could be released. The whole breeding ground not located on outlying rocks—and it was now low water—was gone over and swept absolutely clean. Not a living seal, except a few pups too weak from starvation to move, was left on the "Reef."

As usual, the seals were driven in squads of 200 to 300. The length of the drive was only 650 yards, and in the cold morning entailed no hardship on the seals. On the killing ground they were again collected into two large herds. The segregating of the "pods" to be killed was done very quietly and deliberately, without worrying the entire herd. Only about 190 grown males (too large and too small) were allowed to escape, or 20 per cent of all the males driven. Whatever injury the driving might inflict would consequently be trifling so far as the male element was concerned.

But how about the females? More than three times as many females were driven and returned to the sea as there were bachelors to be killed. How did it affect them? Did they suffer much physically? Does the driving of the females seem to have any influence upon their return to the rookery?

These and many related questions will find an answer in the notes and remarks which I wrote down on the spot during an earlier drive on the same rookery, viz, on July 19, 1895.

A separate tally of the number and kind of seals driven is submitted elsewhere (p. 139), and some of the following notes refer to the "pods" therein enumerated, by "pod" meaning each little flock of seals taken out of the big herd to be killed. Each pod usually consists of bachelors, females, bulls, and pups. The killing gang attempt to hit as many of the bachelors on the head with their clubs as possible, while the other classes are allowed to escape. Occasionally the club glances off and hits the wrong animal or, more rarely, a mistake is made in the identification of the animal clubbed. The following remarks are transcribed from the diary without any attempt at classification:

Female seals were accidentally hurt, more or less severely, during the killing. I noted the more severe cases as follows:

In pod 4, 1 stunned; soon recovered and scampered off.

In pod 18, 1 so severely stunned that a man carried her off by the hind legs; recovered in fifteen minutes.

In pod 25 the most severe case occurred; she was perfectly unconscious for a long while; finally sat up, but could not be induced to move; at 2 p. m. I found her still in the same place in a dazed condition.

In pod 31 a female was also badly hurt and bleeding, but not so severely as one in pod 35, which received a very big scalp wound; both ran away with the others, however.

In pod 7 a yearling was so badly hurt that it was thought best to kill him.

In pod 28 a pup was hurt, but I don't believe it was done by clubbing; it was probably injured in the crush. At 2 p. m. I found it still unconscious in the place where it first fell, but as I roused it by lifting it up by the hind flippers it came to and in a little while ambled off.

Returning to the killing grounds at 7 p. m., I found there a lonely pup roaming about aimlessly. As I saw the other pups escape with and follow the various pods of females, I am inclined to believe that this was the same pup which was hurt and which I was speaking of above. If so, it was very lively now and made a furious resistance, when Abraham Badaef made an attempt to grab it by the hind legs. This he had to be very careful about, for a bite of even such a little fellow—probably not so very many weeks old—might be serious enough; but he finally succeeded and carried the pup off to the beach, where it was left to take care of itself.

I watched the handling of the seals very carefully in order to ascertain the amount of injury they might receive during the affair. The natives were certainly not very particular, much less so than those on St. Paul Island when Mr. True, Mr. Stanley-Brown, and the Treasury agent were observing them, but I can not say that I was much impressed with the severity of the hurt that could have been inflicted. The animals are as soft and pliable as cats, and while there is a good deal of excitement, even panic, and the wildest possible scramble one over the other, none of them seemed to mind it in the least. The whole mass of more than a dozen females would occasionally be piled up on top of a little mite of a pup, but he would immediately pick himself up upon being released and plunge into the seething mass with renewed vigor. The scramble was very suggestive of a game of football, and I feel certain that the seals were less injured, externally and internally, than the average football player; and as for the exertion, excitement, and fright of the drive having any influence upon the procreative power of the bulls, as well might it be asserted that the football players impair their virility and render themselves impotent by playing the game.

Many incidents might be quoted to show how little the seals mind the drive and how soon they forget its hardships. On Bering Island I have repeatedly observed half bulls in a drive trying to mount females in heat during intervals of rest. Another observation is so highly interesting in many ways that I quote it from my diary of July 15, 1895, north rookery, Bering Island, as follows:

> This evening I made a very suggestive observation. While working along the escarpment just west of the salt house I came across a small flock of seals left over from yesterday's drive. They had not returned to the sea, but had located on the very extreme northern point of the escarpment, a considerable distance from the rookery [about 250 yards] and 30 feet above the sea. I was quite surprised at finding the flock to be a "harem" consisting of 1 bull and about 20 females. I could not count their number exactly, as I did not want to disturb them, but there were about 20 females, and I heard at least one pup, though I did not see it. I took up my position some distance off and watched them. Several of the females were in heat and were alternately teasing the bull, getting him by the throat, but he was kept too busy running around trying to keep the harem together, as some of the females were evidently anxious to return to the rookery. He, on the other hand, was plainly well satisfied with the location and intended to hold it. * * * Now, these animals were driven yesterday and not let go until after they had reached the killing ground [only 220 yards away from their present location]. In view of the above observation, it seems absurd to assume that the driving had injured them in the least. Nor can this bull be accused of sleepiness—yet bulls are few on the rookery—for he was kept very busy, indeed.

His vigilance did him no good, however, for the females escaped to the rookery during the night, and the place was entirely deserted when I visited it next morning

It is certainly very significant that on Bering Island over a thousand pups are yearly driven to the killing ground, there to be released, without any visible harm coming to them worth mentioning. If these newly born seals can stand to be driven three-fourths of a mile from Kishotchnoye and to be repeatedly trampled upon by the larger ones piling up four high, or more, on top of them, it stands to reason that the vigorous holustiaki—or even the females—*as a whole* can suffer but little injury from the same cause.

Before leaving this subject it may be well to recall the following points:

On Bering Island the drives are easy, while on Copper Island they are exceedingly severe. Yet on Copper Island the bulls and half bulls are plentiful, while on Bering Island they are comparatively scarce. The severity of the driving, therefore, does not seem to bear any relation to the relative plenty or scarcity of mature bulls on the rookeries.

Again, on Bering Island breeding females and pups are always mixed with the bachelors in the drives. This, on the other hand, does but seldom happen on Copper Island, even nowadays. Yet the female seals on Bering Island are proportionately more numerous and do not appear to be less vigorous or less prolific than on Copper Island. Moveover, the productivity of the Copper Island rookeries has evidently suffered more of late years than those of Bering Island. The driving, therefore, does not seem to be responsible for the depletion of the rookeries.

DOES THE FEMALE SEAL NURSE HER OWN PUP ONLY?

The question whether the mother seal nurses her own pup only, or whether she will allow other pups to suck her promiscuously, has been causing quite a controversy. To persons who have not studied the question on the rookeries with the closest attention it seems an absurdity to suppose that a female seal, after an absence of a day or more, during which her pup has been mingling with the thousands of other pups and roaming all over the rookery with them, should be able to find it and recognize it. During my visit to the islands in 1882–83 the question was not up, and I had paid no special attention to it. On thinking of the multitudes of pups which I had seen podded together in those days I was, therefore, on theoretical grounds, strongly inclined to side with those who deny that such a search and recognition takes place, and I so expressed myself to Mr. True when we talked this matter over on our way to the Pribilof Islands. I resolved, however, to pay special attention to this question. The great difficulty lies in the impracticability of so singling out a number of *mothers with their young* and so marking them that they could be individually reconizable at a distance and for several days at least. Only in this way would it be possible to gather proof conclusive to others than the observer himself, particularly to persons who might not be willing to accept his other observations as final.

My observations on the rookeries, however, have been sufficient to convince me that I was wrong in doubting the ability of the mother to find and recognize her individual offspring among thouands of pups of identically the same appearance. Some of these observations noted down in my diary follow here in the very words written down on the spot.

Kishotchnoye rookery, Bering Island, July 16, 1895.—Old bulls are certainly scarce and of holustiaki I have thus far seen none. Pups are very plentiful, and the females do not appear to have been barren when they arrived. The pups are already "podding," and the two backward extensions on either side of the "parade" consist chiefly of pups.

The matki come and go, especially those that are wet and apparently just in from the sea, while the dry ones [meaning those with the fur dried from having been longer ashore] lie still, sunning and fanning themselves.

Right in front of me, about 200 feet away, is a small group of 6 dry matki and close to them a pod of about 50 pups. About 20 feet to the left is a lonely sikatch; then another similar group of dried matki and pups. The dry mothers are silent and lie down sleepily. The bull has not changed his position, his nose sticking right up into the air, during the last hour; he probably sleeps. Occasionally a wet matka [i. e., with wet fur] comes ambling up from the sea, and fighting her way through the harems next to the water's edge finally reaches this group, which is located at the posterior left-hand horn of the breeding ground—the very edge of the rookery. Such a matka will stop occasionally, shake her head and bleat (apparently in anger); a few pups will rush at her; she noses them; finally shows her teeth, bleats, shakes her head, and ambles away to repeat the performance at the next pod. A matka with only a large wet spot on the hind quarters [she had consequently been a considerable time out of the water] came up in this fashion to this pod, and after nosing about in the midst of it finally grabbed a pup by the skin of its neck, much to the disgust of the pup, apparently, and carried the little one off, part of the way holding it in her mouth, part of the way pushing it ahead between her fore flippers. In this manner she brought it through several pods of pups and groups of females down to an old sikatch, a distance of fully 150 feet, where she lies down, but I can not see whether she is nursing the pup, as she is down in a hollow. I see, however, that the pup tries to escape—probably wants to go back to play—but is brought back every time.

Some of these wet matki will stop several minutes in front of four or five pups and nose them repeatedly, as if in doubt, before they go away. * * *

There is a remarkable individual variation in the voice of the females.

At 1 o'clock p. m. I moved to the northern end of the rookery. Among the notes written down there I find the following:

> The pups were very active, running to and fro, but I could not discover that any of them went very far away from where I saw them first. On the other hand, females hauling out of the water were constantly traveling all over the rookery, calling and bleating.

Later in the season similar observations were made on the little South rookery, Bering Island (August 17, 1895). The notes then written down also contain some reflections of a general nature upon the question. It is hardly necessary to add that upon further reflection I still adhere to the opinion then expressed—an opinion which may possibly have some weight, written as it was in plain view of the seals it refers to. That part of my diary reads as follows:

> I was able to get very close to the grounds, which were occupied by mothers and pups only. A good many of the latter were in the water, but there was also quite a large pod of smaller pups at the posterior edge of the herd [near the place where I was watching]. I was again impressed, as before on Kishotchnaya, by the action of the females and pups when the former haul up from the water and go in search of the young to nurse it. The ground is here so small that it is a comparatively easy task for the mother to find its young, and I consequently observed several dripping-wet cows nursing pups. The mother in coming out of the water made straight for the pod of pups and the usual performance of pups rushing up and, upon being nosed at critically, refused, whereupon her search continued, was gone through.
>
> So much is absolutely certain, that the females do not nurse the pups promiscuously. I am thoroughly convinced by what I have seen that the mother wanders considerable distances and spends much time in searching for her own individual child. Whether a mother who had searched in vain for a long time, and whose milk was pressing her very strongly, might not finally give in to the importunities of a particularly hungry pup is a question which it will probably never be possible to answer definitely, but I think such cases [if they occur] are the exceptions; the rule is certainly the reverse.

To the above I need add but little by way of argument. Persons who reject it on purely theoretical grounds have adduced much testimony to show how some other animals do not discriminate between their own young and those of other mothers, but anyone who has studied the habits of wild animals will know how utterly futile such an argument is, and how absurd it is to conclude from one species what are the habits of another.

I may finally, however, call attention to the fact that the opinion here held has of late received strong confirmation. I refer to the thousands of starving pups of late years found on the rookeries; for if the females were willing to nurse the pups of other mothers as well as their own there would seem to be no reason at all why any pups should starve to death.

MORTALITY OF PUPS.

The above reflection leads me to the question of the mortality of pups on the rookeries. With the reports of the appalling loss of pups on the Pribylof Islands fresh in my mind, one of the first inquiries I made on Bering Island, upon my arrival, naturally was whether any unusual mortality had been observed there.

The answer came from an authoritative source that—

> No abnormal mortality had been observed among the pups on the Commander Islands. A few are killed on the rookeries by the old bulls stepping on them, or otherwise, and others are caught in the breakers and surf and are thrown on the beaches. The skins of these are all utilized and their number on each island averages about 200 a year.

This was also the opinion of everybody I spoke with.

On August 1 and 2, 1895, Mr. Grebnitski and I visited the Karabelnoye rookery on Copper Island, i. e., the eastern end of it, particularly the beach near the "Stolp" and the first breeding ground. On the 1st of August we found "two dead pups, one with the placental cord still attached, but too much decomposed to make an examination of the cause of death possible."

The next day we visited the same place again:

> A few more dead pups were seen on the rookery this morning, all decomposed. They are easily accounted for, and the native was undoubtedly correct who stated that he had observed that the great number of sikatchi [remember, there were plenty of bulls on the Copper Island rookeries] caused so much fighting among them that many pups which came in their way got trampled upon and killed. The number, however, is plainly insignificant.

On August 22, 1895, in company with the captain, Mr. Francis R. Pelly, and several of the officers of H. B. M. S. *Porpoise*, I attended a large drive on the North Reef rookery, Bering Island, the same of which I have given a description previously in this report (pp. 74–75). In order to fully appreciate the account which is to follow, it is necessary to remember that this great rookery covers a long rocky reef and that low tide (the difference between high and low water being about 4½ feet) uncovers a long stretch of rocky beach which forms the favorite roaming and playing ground for the pups. (Compare photographs 19*b* with 22*b*.) It should also be borne in mind that, as I have stated previously, it was extreme low water at the time we went with the natives on the rookery to take the drive.

When all the animals had been driven off, I remained behind to investigate. On the rookery ground I was startled by the great number of dead pups. I was wholly unprepared for this, because at the great distance from which it had become necessary to watch the rookeries here the small bodies of the dead seals have not been noticeable; in fact, I do not see how in the binocle they could have been distinguished from sleeping ones.

Those lying in a windrow along the high water margin of the rookery were most conspicuous. These had evidently been washed ashore. A good many of them were in an advanced stage of putrefaction—some entirely flattened out and without hair. But an equal proportion had evidently died more recently, being in good condition. There was another class of pup carcasses, viz, those which were lying dead upon the higher portion of the breeding ground, away back from the water's edge. These were mostly all in good condition and appeared as if they had died within a few days.

When the seals were driven off, as many pups as possible were allowed to escape into the sea, and they availed themselves of the opportunity offered to go off in large flocks. But there was a considerable number of pups staying behind singly, which upon our approach made but feeble attempts at getting away. Evidently something was the matter with them. Upon a closer examination they were found to be very weak, and their thin, pinched appearance was at once noticeable. They were starving; their shoulder blades and ribs and hips were sticking out in strong contrast to the rounded and plump forms of those scampering off with the others. Upon handling the carcasses, both in the windrow and on the higher ground, the same state of affairs was apparent, viz, extreme leanness and emaciation.

After the rookery had been completely cleared I took my notebook and, walking along the beach (starting at the south end, west side), began to count the number of dead pups, making a distinction between those in good condition and those in an advanced stage of decay. I had gone about halfway round and counted about 200 of the former class and 150 of the latter, when the starshena arrived, and said he had orders from the kossak, Nicolai Selivanof, to ask me to leave the rookery at once.

It was evident later that Selivanof was uneasy because he thought that the number of dead pups might in some way become charged against the management, for he tried to make the whole thing a small affair, and explained to me that the number of dead pups was due to their being trampled upon by the sikatchi. But for three very good reasons this theory does not hold: (1) There are now very few sikatchi on the rookery at all, entirely too few to be able by any possibility to even kill a small fraction of the pups which have recently died; (2) if this trampling caused the death of so many pups, how many might we not expect in a drive like the one to-day, in which hundreds were trampled upon, not once, but over and over again, yet not a single dead pup was found in the wake of the drive; (3) this explanation does not account for the emaciated condition of the bodies of the dead ones.

Seeing the necessity of complying with the order to leave the rookery, I could not finish my count. I am pretty positive, however, that the following estimate is not much out of the way. I may preface it by saying that the number of dead bodies on the east side appeared to be about double that on the west side:

Dead pups on west side, counted, about	350
Dead pups on east side, estimated, about	700
Dead pups on high ground, estimated, about	200
Total	1,250

In leaving the rookery I took from the high ground two bodies, which seemed quite fresh and from which, therefore, it would seem possible to determine the cause of death. In lifting the second body up by the hind flippers I was somewhat startled to find it still gasping, though it was much too weak to give any signs of life when lying on the ground. I carried it up to the killing ground, where the rest of the company had congregated, but the pup had died before I reached them. The other pup had died apparently during the previous night.

The doctor on board the *Porpoise*, Surgeon Lloyd Thomas, kindly consented to attend the post-mortem. On viewing the opened bodies he agreed with me that death was due to inanition—lack of food. They were starved to death. There was not a trace of fat left in the tissues under the skin nor on the muscles. The extreme leanness of the carcasses was very noticeable. Both of us afterwards commented upon the plumpness of the average pups as they appeared in the drive.

I satisfied myself while on the rookery that the fresh bodies in the windrow were in the same condition, and the fact that they were thus thrown up on the beach by the sea signifies nothing, for we had had no severe weather as yet, and it is therefore impossible that these pups could have been killed by any "surf nip."

It may be well to remark right here that the fact that these bodies were found in a windrow at high-water mark does not imply that they died in the water or were killed by the sea. I have explained above that at low water a long stretch of beach is bared, upon which the pups roam about and play. Naturally, a good many of the starving pups died there at ebb tide, and their emaciated bodies were thrown up by the rising tide. It may even be reasonably supposed that these hungry pups would attempt to keep as close as possible to the water's edge, to beg nourishment of the females landing.

On the 16th of September I had another chance to inspect the north rookery. My experience was as follows:

> Very few seals were seen on the rookery, only a few thousands all told; the "sands" were almost entirely deserted, nor were any seals to be observed in the sea. Those on the reef were cows and pups, the majority of the latter now gray. One or two old bulls were seen and half a dozen large four or five year olds mingling among the females, apparently playing sikatchi. I found a great number of dead pups; there were at least twice as many as on August 22. All, or nearly all, were lying in windrows. Curiously enough, there were no very fresh bodies which might have been killed by the recent northerly swell; all I saw were dead at least one week. It was also notable that nearly all were black, only here and there a gray one.

After all, the absence of fresh bodies does not signify much. I have no doubt that most of them were eaten or carried off by the blue foxes. Since the decrease in the number of seals killed the natives on Bering Island have utilized every seal carcass, salting the best parts for their own use and putting the rest, including the entrails, into holes in the ground for winter food for the sledge dogs. The foxes in the neighborhood of the rookery, instead of feasting on the carcasses on the killing grounds and elsewhere, are therefore reduced to making a precarious living out of what they can snatch from the rookery. There being now only a few old seals on land, the foxes and their young, at this time nearly full grown, naturally clean the ground very early every morning of every pup dead during the night. The flock of large sea gulls (*Larus glaucescens*), always present on the rookery, also dispose of many bodies. It is therefore perfectly safe to assert that a great many more seal pups have died than any census based on the dead bodies present on the rookeries will account for.

It may be observed in the present connection that the bodies of even grown seals disintegrate and disappear with amazing rapidity. The combined efforts of the foxes, the birds, the staphylinid insects, and the fly larvæ reduce a carcass in very short order to a skeleton. During the winter the bones become scattered. If they are lying on or near the beach the furious winter surf sweeps them away; if they are farther away the decaying rank vegetation covers them up. During the winter the waves wash over the entire "reef" and the "sands" as well, and not a trace of the starved-pup carcasses will be found on the beaches the next season.

It is a curious fact that the natives and the kossak in charge of the rookery were trying to make light of this state of affairs, although the very fact that the latter prevented me from finishing the count is evidence enough that he was aware of it. As mentioned in the abstract from my diary, he suspected that the great mortality might be charged against management. I have shown that his argument that the pups were being trampled to death on the rookery has no foundation in fact, but I did not mention, however, his answer to my question why he thought so. It was to the effect that the flattened condition of the dead pups showed that they had been trampled upon. Now, it is quite true that these half-decomposed bodies present a very much flattened appearance, but that is not surprising when we consider the amount of cartilage in their skeleton. Moreover, there is no doubt that they have been trampled upon, but that took place *after they were dead.* After I had demonstrated to Selivanof and some of the natives that the pups had died from starvation and not from any injuries received, there was evidently a load taken off their hearts, and lamentations over the great number of dead pups were heard all around. I mention this incident chiefly to show how little dependence can be placed upon the observations made by the natives, and more particularly upon their deductions, or the explanations they see fit to make.

From the above it may be regarded as well established that during the past season an unusual mortality took place among the seal pups on Bering Island, and that they died of starvation. There seems but one reasonable explanation of this phenomenon, viz, that they starved because their mothers were killed, and as they were not killed on the island there seems to be no other logical conclusion but to assume that they were killed by the pelagic sealers.

I am well aware that the above statements have been made light of in certain quarters, and it has even been said that I have exaggerated the facts. To this I can only answer that nobody else but myself investigated the case in 1895; that I have the captain, doctor, and other officers of the British man-of-war as witnesses to the accuracy of my statements. Fortunately, the Commander Island rookeries were again investigated by competent scientists, whose observations fully corroborate the correctness of mine, and who also encountered the same curious reticence and apathy of the Russian authorities relative to the whole question of the mortality of the pups. This will be more fully dealt with in the chapter relating to the condition of the Commander Island rookeries in 1896.

Mr. Venning's experience on north rookery on August 28, 1893, also points in the same direction. He examined about one-third of the rookery, and "counted 285 dead pups, 150 of which had certainly died this year." These 150 were undoubtedly pups which had died recently, probably of starvation, while the other 135, which he mistakenly thinks were left from the previous year, had died earlier in the season, probably very shortly after their birth. (Venning, Rep. 1893, p. 11.)

ALLEGED CHANGES OF HABITS.

During the recent discussions relative to the habits of the fur seals and to the seal fisheries, it has been asserted by various persons that the habits of the seals have undergone, or are undergoing, material changes. Curiously enough, such changes have been alleged by both sides; but while one side attributes certain alleged changes to the disturbance of the seals on the rookeries, the other side insists that certain other alleged changes are due to the interference of the pelagic sealers.

It must not be forgotten that the habits of the fur seals at the present time are the result of a long evolution, which dates back, possibly, millions of years. The habits of the North Pacific and South Pacific seals in most essential points are alike, and as these seals belong to very distinct species it is practically certain that these habits were formed before these species had emerged from the common ancestral stock. This separation probably dates back to the time when the North Pacific seals became geographically shut off from intermingling with the southern forms. From that early period the differentiation of the local habits of the former must have gone on for ages, until now there is inborn in every seal an instinct which is the inherited accumulation of the doings of tens of thousands of generations repeated every year.

It must, moreover, be borne in mind that the fur seals are gregarious animals. Such animals always act in flocks; their habits are the habits of the flock. Individual deviation from the habits inborn does not materially affect the habits of the whole community. To effect a change in the habits of such a species it would be necessary not only that the bulk of each yearly class should change their habits in the same way, but also that the causes should continue long enough to allow the change to be transmitted to the offspring through an unknown number of generations. This is particularly true where, as in the present case, the disturbing causes mainly affect the male sex.

The first detailed description of the habits of the northern fur seal, after Steller's account, is, as I have shown (p. 84), by Veniaminof in 1839. The next by Bryant (1870) and Elliott (1874). No change of habits is alleged up to that time. In fact, these changes are supposed to have taken place during the last five or ten years.

The theoretical considerations presented above have not been submitted with any intention of overriding by *a priori* reasoning any statement of alleged facts, though it is believed that its soundness is unassailable. It is only my intention to show the utter improbability of any change of habits within the short period in which man has interfered with the fur seal in order to demand strong proof in support of the alleged changes. In view of that improbability we can not accept a change of habit as the explanation of certain phenomena unless demonstrated beyond peradventure, or no other reasonable explanation can be furnished. Much less can we be expected to admit such changes simply upon hearsay evidence or speculations of a general nature.

Now, for the alleged changes in so far as they have had reference to the habits of the Commander Islands seals.

The decrease in the number of killable seals on the rookeries has been attributed to their having been driven off to seek other haunts. It is alleged that they are staying at sea and that they are forming rookeries on the Kamchatkan coast.

The evidence in support of these conditions are of the most indefinite kind. On a couple of occasions fur seals are *believed* to have hauled out at certain uninhabited rocks on the eastern coast of Kamchatka. In the first place, the accounts are so devoid of details that it is impossible to attach much importance to them. In the second place, granting that fur seals do haul up there occasionally, what scintilla of proof is there that they have not done so always?[1] As a matter of fact, I heard these rumors of fur seals hauling out on the coast of Kamchatka during my first visit, in 1882–83, and I know positively that Captain Sandman contemplated a trip to go in search of the alleged rookeries as far north as the island Karaginski. Nearly the whole eastern coast of Kamchatka, for a distance of more than 400 miles, is almost entirely uninhabited, and very seldom visited by man.

The other evidence offered is the fact that lately the sealing schooners have been found taking fur seals during the summer months off certain capes in Kamchatka, notably Cape Shipunski. Here the same objection obtains. What proof is there that seals might not always have been taken there in summer? Moreover, is it certain that the seals taken there by the schooners represent the bulk of the "killables" of the islands? On the contrary, it is probable that these locations of schooners indicate the feeding grounds of the females, as hinted at in another chapter of this report. Krashenninikof's statement that "none of them are to be seen [on the east coast of Kamchatka] from the beginning of June to the end of August," only relates to the immediate coast itself and not to the open sea, where pelagic sealers make their catches.

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[1] They apparently did so occasionally more than 150 years ago, if Krashenninikof's statement, that "they seldom come ashore about Kamchatka," means anything.

The explanations offered of these alleged, but utterly unproven, changes of habits are diametrically opposed to each other. Those postulating that the regulated driving and killing of the bachelor seals on shore is causing the decrease of seals on the islands, explain that this interference with the seals has led them to seek other haunts—in this case the coast of Kamchatka. There was never any evidence that seals were driven away from any place frequented by them habitually and took up their abode habitually in some other place. Elliott (Monogr. Pribyl., 1882, p. 109, footnote), it is true, in speaking of the "rapacious hunters" that were drawn to the Commander Islands, states as follows:

> They appear, as near as I can arrive at truths, from the scanty record, * * * to have killed many and harassed the other fur seals entirely away from the island; so that there was an interregnum between 1760 and 1786, during which time the Russian promyshleniks took no fur seals. and were utterly at loss to know whither these creatures had fled from the islands of Bering and Copper. When they (the seals) began to revisit their haunts on the Commander Islands, I can find no specific date. * * * I think, therefore, that when the fur seals on the Commander Islands became so ruthlessly hunted and harassed, shortly after Steller's observations in 1742, then they soon repaired, or rather most of the survivors did, to the shelter and isolation of the Pribilof group, which was wholly unknown to man.

As will be shown in the historical part of this report (p. 114), the seals, as a matter of fact, never fled from the islands of Bering and Copper, and Elliott's statement rests on a misapprehension. In the very year 1786, when Pribilof first discovered the islands which now bear his name, there returned to Kamchatka two vessels loaded with fur-seal skins which could only have been taken on the Commander Islands, viz, one belonging to Protassof, "the cargo consisting chiefly of fur seals," and one belonging to Shelikof, with no less than 18,000 seal skins. Pribilof, with his cargo of over 31,000 seals from the new islands, did not return until several years later.

The other explanation offered by some of those who ascribe the decrease of the seals on the rookeries to the interference by the sealing at sea rests on an assumption that the sealers, by stationing themselves at intervals across the path of the seals on their northward migration, actually cut the seals off from the islands, thus forcing them to go elsewhere, or, in the case of those finally reaching the islands, materially delaying them on the way. It would seem that to anyone who has seen the way in which seals travel during their migrations it would be plain that it would be impossible for many times the number of sealing schooners now in existence to effectually block the progress of the migrating herds. It may well be that the positions of the schooners if plotted on the charts would show them to thus stretch across the path of the seals (it has been so asserted in Russian reports), and the large marks on the chart may well convey such an impression, but at sea the thing is quite different.[1]

This last explanation hints at the other alleged change in the habits of the seal, viz, an increasing lateness in the arrival of the bulk of the seals and a corresponding lateness in many of the phenomena of seal life on the islands. It is utterly inconceivable, however, that the sealers can even delay the bulk of the migrating herds

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[1] For the contemplation of those who believe in the schooners being able to cordon the sea so as to actually intercept the seals, I submit the following: In the latter part of July, 1892, to the end of August, numerous schooners killed seals south of Copper Island. If the position of the daily catches of eight of them be plotted down on a chart, it will be seen that they covered pretty evenly an area of 13,000 square nautical miles (roughly speaking). As their combined catch amounted to about 4,000 skins, it is plain that they secured about one seal on every 3 square miles (see map, pl. 1).

materially, and the explanation, therefore, would not explain, even if the allegations of the increasing lateness of the phenomena alluded to could be substantiated, and in my opinion they can not.

A glance at the table of seals killed on north rookery, Bering Island, during the season of 1895 (p. 139) shows that nearly one-third of the total number of skins was obtained between the 22d of August and the 13th of September (the skins being shipped September 16); in other words, during 1895 nearly one-third of the skins was taken after the time when the skins were usually shipped. Thus, in 1894 the skins were shipped August 27; in 1893, August 22; in 1892, August 24. The earlier records to which I have had access are rather incomplete, but from 1877 to 1882 the seal skins were shipped from the north rookery, Bering Island, on the following dates:

1877	Aug. 26	1880	Aug. 20
1878	Aug. 16	1881	Aug. 13
1879	Aug. 29	1882	Aug. 16

It will be seen that even in the palmiest days of the rookeries, long before the advent of the pelagic sealers, the shipping dates do not differ materially from those of the years 1892 to 1894. The lateness of the catch in 1895 is therefore abrupt and exceptional. There is a great deal of difference in the dates upon which the hunting ceases, even in former years. Thus, on Glinka, Copper Island, the catch was all in on the following dates:

1877	June 30	1880	Aug. 7
1878	July 12	1881	July 30
1879	Aug. 1	1883	July 13

But the lateness of the Bering Island season of 1895 is not explainable in that way either, for no amount of backwardness of the season would account for the catch after the middle of August. The summer of 1895 was certainly a cold and late one, and the snow was in places lying down to the water's edge the entire summer; but the season of 1879 was also late, according to the records, and the "year remarkable for much snow," yet the sealing season closed on both islands on August 2. There must consequently be some other reason for the lateness in 1895.

Here is where the plea comes in that the killable seals in 1895 arrived later on the rookeries than in former years. In answer to this I would like to ask the question, Is there anybody familiar with the north rookery, Bering Island, who would deny that it would have been feasible in any previous year to have obtained there 2,670 skins between August 13 and September 13, if an attempt had been made to "scrape and rake" the rookery to the same extent as in 1895? However, the table of the seals killed on that rookery in 1895 (p. 139) directly disproves the alleged late arrival of the killables, for it will be seen that the proportion of the killables to the other classes of seals driven was decreasing toward the latter part of the season, instead of increasing. Thus, before August 12 the average proportion of killed seals to those escaping was as 1 to 2.2, while after that date it fell to 1 to 3.75.

The following table shows how exceedingly variable the first arrival of killables on the rookeries really is:

First drives on Bering Island, north rookery.

Date.	Number of skins.	Date.	Number of skins.
1877, June 29	911	1890, May 25	41
1878, June 3	3	1891, May 29	51
1881, May 31	221	1892, June 1	91
1882, June 8	512	1893, June 24	826
1883, June 19	1,552	1895, June 13	110
1889, June 19	1,103	1896, June 17	192

The true and only explanation of the exceptional lateness of the season on Bering Island lies in the fact that killable seals, especially the younger classes, had become very scarce, and that, consequently, in order to get as many skins as possible—the company and the natives being equally eager to make up the threatened deficiency—seals were killed until the advanced staginess of the skins put a stop to it, as proven by the fact that in the last drive, in which 194 seals were killed, 51 were more or less stagy.

This statement recalls the other change alleged to have taken place. It is asserted that the skins become stagy later in the year now than formerly.

In order to fully weigh this allegation it is well to call to mind the fact that there are very few detailed and definite observations upon this point so far as the Commander Islands are concerned. Nowhere do we find any series of observations concerning this question continued through a number of years. It can not be too often emphasized that there is a great latitude of date in the events of seal life,[1] and assuredly the beginning of the stagy condition of the skin is no more bound to a rigid observation of the calendar than the other phenomena. Moreover, we do not at all know the causes which are responsible for these fluctuations; we do not know the conditions which accelerate the advent of the stagy season or postpone it. Possibly cold and damp weather may retard it. In that case we might expect the skins to become stagy somewhat later in 1895. The only definite record, so far as the Commander Islands are concerned, that I am aware of is the statement by the British Bering Sea Commission (Rep. Bering Sea Comm., 1893, p. 50) that "in 1891 we found the 'stagy' season was just beginning on the Commander Islands on the 1st of September." In 1895 there were 14 stagy skins taken in the drive on September 10. The "beginning" must, therefore, have been somewhat earlier—enough to show that in this respect 1895 is not extravagantly late.

The lack of reliable information concerning the beginning of the stagy season in earlier years is easily explainable by the fact that the killing season was over long before there was any suspicion of staginess. The question then was not at all "When does the stagy season begin?" but, on the contrary, "When does it end?"

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[1] The first arrivals on Bering Island rookeries are shown in the following statement:

Date.	Rookery.	Arrivals.	Date.	Rookery.	Arrivals.
1879, May 5	North	2 bulls. 1 bachelor.	1882, April 19	North	4 bulls.
1880, April 27	do	3 bulls.	1883, May 23	South	2 bulls.
1881, May 20	do	2 bulls.	1895, May 10	North	1 bull.

The reason of this was that the natives were anxious to begin the autumnal catch as early as possible, in order to get fresh meat, which they had been obliged to be without since the end of the killing season. Thus I find in the records of Bering Island station for 1878 that on October 13 it was contemplated to take a drive in order to get fresh meat. The "chief wished first to ascertain how skins looked at present, supposing they were too stagy yet," and accordingly went himself to the rookery, whence on the 16th he returned with 9 skins, reporting that "fur was good." The drive was therefore made and 520 seals taken on October 18.[1]

The explanation of the fact that nowadays many phenomena appear to happen later is easy enough. During the years of plenty very little attention was paid to them except in the most general way. Such a thing as detailed observations and records throughout the season for a number of years sufficient to furnish exact data for reliable deductions were (and, as a rule, are yet) unknown. This is particularly true of phenomena happening after the finishing of the catch. But now, in the days of threatened commercial extinction, when the rookeries and the seals are under constant and anxious inspection, many things appear unusual and new. The killing season being extended in order to fill the required complement of skins, the impression easily takes hold that the phenomena particularly noticed during the thus belated season are themselves likewise belated.

FEEDING GROUNDS OF COMMANDER ISLANDS SEALS.

It was formerly held by those who had anything to do with the Russian fur seals that the females only went a comparatively short distance from the islands to feed. This assumption was based upon no observed fact whatsoever, and was only a general expression of the total ignorance of the true location of these feeding grounds.

When the Canadian sealing fleet, in 1892, in a body resorted to the Commander Islands, after having been excluded from the eastern portion of Bering Sea, an inkling of the truth was felt, and undoubtedly to some extent influenced those who were responsible for the 30-mile zone fixed in the Russian-British *modus vivendi* of 1893. But it was not until the logs of the more successful schooners had been published and their positions at noon every day, with numbers of seals taken during the past 24 hours plotted on the charts, that the true status of affairs was made clear. It was then manifest that the bulk of the catch was taken on a comparatively limited area south of Copper Island, approximately bounded by 52° 30′ and 54° 30′ north latitude, and by 165° and 170° east longitude. The richest hauls, however, were made within a much more restricted area south and south-southwest, and on the line between this area and the rookeries of that island. As a matter of fact, the overwhelming majority of the skins were taken more than 30 miles distant from the island, and most of the skins that were taken closer in were secured by those of the schooners that found it more tempting to raid the rookeries from a safe distance. The time of the season during which the fleet operated that year was chiefly during the months of July and August. There is, therefore, not the slightest doubt about the correctness of regarding the area as above limited as the feeding grounds of the seals frequenting the Copper Island breeding grounds (pl. 1).

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[1] The difference from the Pribilof Islands will be noted, as in the latter the natives were allowed to take seals for food in the stagy season. (See, for instance, Fur Seal Arb., v, pp. 714, 715.)

The season of 1892 failed to throw much light upon the question where the Bering Island seals go to feed during the same months. The *Vancouver Belle* made a reconnoissance to the northeast and north of Bering Island, at a distance varying between 20 and 100 miles, but obtained only a few (13) stray seals, and hastened back to the Copper Island grounds. The *Maud S.* made a similar trip of exploration around Bering Island with a similar result (27 seals). The experience of the fleet, however, demonstrated pretty clearly that the Bering Island seals do not go to the Copper Island grounds to feed. It seems that the *Henry Dennis* was on or near the Bering Island feeding grounds, for between August 1 and 7 she took 189 seals in a restricted area a little more than 100 miles due northeast of the Bering Island north rookery.

The experience of 1895 and 1896 shows that the Bering Island feeding grounds are more distant and more extensive than the Copper Island ones, being located to the north and northwest of Bering Island. A glance at the maps showing the catches made on the Commander Islands feeding grounds (pls. 87 and 88) must convince anyone that the seals breeding on the two islands also go to feed in separate parts of the sea. Where the fur seals living at the Bering Island south rookery go to feed, whether with those of north rookery or those of the Copper Island rookeries, or whether they have feeding grounds of their own to the west of their own beach, is impossible to say, though the latter alternative seems the most probable, judging from the maps just quoted.

IV.—THE RUSSIAN SEALING INDUSTRY.

HISTORICAL.

Even before the discovery of the Commander Islands, in 1741, the fur seals were known to and hunted by the natives of Kamchatka. Krasheninnikof (Hist. Kamtchatka, 1764, p. 124 et seq.) refers to this catch as follows:

> The sea cats are caught in the spring and in the month of *September*, about the river *Shupanova;* at which times they go from the *Kurilskoy* island to the *American* [i. e., Commander Islands] coast; but the most are catched about the cape of *Kronotzkoy*, as between this and the cape *Shupinskoy* the sea is generally calm and affords them better places to retire to. Almost all the females that are caught in the spring are pregnant; and such as are near their time of bringing forth their young. are immediately opened, and the young taken out, and skinned. None of them are to be seen from the beginning of *June* to the end of *August*, when they returned from the south [!] with their young. * * * They seldom come ashore about *Kamtchatka*, so that the inhabitants chace them in boats and throw darts or harpoons at them, which stick in their body; to this harpoon is fixed one end of a rope, and the other is in the vessel, and by this rope they draw them towards the boat; but here they are to be particularly cautious whenever they chace one, if he comes near, not to suffer him to fasten upon the side of the boat with his fore paws and overturn it; to prevent which some of the fishermen stand ready with axes to cut off his paws.

In later times there has been no such regular catch of fur seals on the Kamchatkan coast, for the reason that now the whole region from the Bay of Avatcha to the mouth of the river Kamchatka is entirely uninhabited.

Following the discovery of the Commander Islands numerous vessels were fitted out to hunt fur-bearing animals on these islands and, later, to lay in provisions of sea-cow meat for use in their protracted journeys to the Aleutian Islands farther east (see Stejneger, American Naturalist, 1887, pp. 1049–1052). It does not seem, however, as if the fur-seal skins were in demand. The skins were not particularly valuable; the sea otters and blue foxes were still numerous; the men had more pressing and profitable things to attend to; the drying of the seal skins was both laborious and precarious in the damp climate; in brief, it did not pay to bother with the fur seals at that period. Later, however, all this was changed. The more costly furs were getting scarce and the enterprising Russian merchants, now following upon the heels of the promyshleniks, or hunters, had found a profitable market in China for large quantities of the cheaper fur seal. Foremost among these merchants was Grigori Ivanovich Shelikof, whose name, from 1776 on to his death in 1795, was connected with the fur trade and colonization of that part of the world. He seems to have been the first to pay special attention to the skins of the fur seal, and was for a long time the only one who gathered them in large quantities.

The discovery of the Pribilof Islands, with their countless numbers of fur seals, did not seem to have made any difference in this. On the contrary, the increased supply seems to have created an increased demand. Under the pressure of a fierce competition a senseless slaughter of the fur seals was carried on until the whole business was threatened with destruction, from which it was alone rescued by the formation of a dominant company, which soon swallowed up the smaller concerns and obtained a monopoly of the entire trade of the region.

By the establishment of the great Russian-American Company, in 1799, Shelikof's enterprise was merged into the larger concern, and the Commander Islands became part of what was from now on in reality a Russian colony. The supply of fur-bearing animals must have become practically exhausted on the Commander Islands by that time, for the islands were abandoned and vessels touched but seldom, scarcely one in five years, though an attempt at a permanent settlement on Bering Island was made in 1811 (Savitch, Otchet, 1893, p. 38, footnote, and p. 10). As stated above (p. 36), there appears also to have been a more or less temporary population located on the islands about 1819. In 1826, during the second term of the Russian-American Company, a new district, the district of Atkha, was formed, consisting of the Commander Islands and the western portion of the Aleutian chain from Attu to the island of Yunaska, consequently including the Near Islands, the Rat Islands, and the Andreanof group. The agency was located on Atkha Island.

Shortly afterwards the permanent colonization of the Commander Islands was undertaken, and Aleuts and half-breeds from the Andreanof Islands and from Atta were transferred to the new settlements on Copper and Bering islands. This was accomplished before 1828, in which year Admiral Lütke, in the corvette *Seniavin*, visited the latter island and communicated with the promyshlenik Senkoff at Saranna, on the north coast.[1]

Very little is known concerning the islands and the seal industry on the islands during their occupancy by the Russian-American Company. Its jealousy of both foreign and domestic interference caused it to keep all details of its dealings secret, and as the islands were entirely away from the ordinary line of travel, scarcely any outside information is to be had. The overseers were probably unimportant, possibly uneducated, persons, and the reports of the inspectors occasionally visiting the islands are probably buried in the St. Petersburg archives of the company.

There can be no doubt that the alarming decrease in the Pribilof catch, which in ten years dropped from 60,000 skins to less than 20,000, caused the company to colonize the Commander Islands in order to work the seal rookeries there. In 1821 this decrease was threatening enough to make the board of administration of the company suggest stopping killing on the Pribilofs altogether for one season, if certain islands which were supposed to exist north of the Pribilof Islands should be found to be fictitious or not to harbor the hoped-for fur seals (Fur Seal Arb., VIII, p. 323). The discovery was evidently not made, and the reoccupation of the Commander Islands resulted.

It seems, however, that the Greek war of independence against Turkey had a depressing effect on the fur market of Europe, and it is therefore not improbable that the Pribilof Islands were capable of filling the demand until the restoration of order in that part of the world, about 1830. By this time the annual yield of the Pribilofs had fallen to 16,000, and shortly after even as low as 6,000, the average during the ten years from 1832 to 1841, inclusive, being less than 9,700 skins a year. As I have shown elsewhere, this was not nearly enough to satisfy the demand, which probably averaged in the neighborhood of 25,000 during this period, and the deficiency was probably made up in the Commander Islands.

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[1] Senkoff told Lütke that the settlement was located on the west side of the island (now Nikolski), and that he was only at Saranna with a few natives to build some huts for the fox hunters in the winter. There were then 110 inhabitants on Bering Island, but no permanent colony as yet on Copper Island (Lütke, Voyage aut. Monde, I, 1835, p. 275). This fact shows that Dybowski's statement that the settlements were not established until 1830 (Wyspy Komand., p. 36) is erroneous.

With the destructive methods then in vogue, it is not to be wondered at if the Commander Islands were unable to furnish an annual quota of, say, 14,000 skins for any considerable length of time. Lütke, as early as 1835, speaks of the decrease of the seals on the Commander Islands. "The catches," he says, "have decreased to a remarkable extent here as elsewhere. Of late years there has not been taken on both islands more than 5,000 fur seals; it has consequently been determined to give them a rest for some years" (Voyage aut. Monde, I, p. 276). This close season was probably not carried out, however. The Pribilof Islands could not supply the demand, and it seems as if it became necessary to tax the Commander Islands to the utmost limit rather than to spare them. I have elsewhere shown that the latter islands in all probability were made to yield possibly no less than 14,000 skins annually from 1833 to 1841. The slaughter must have been terribly ruinous, for Chief Manager Etholin in 1842 asked permission to establish a close season, which was granted in 1843. No seals were apparently killed until 1847, but so much were the rookeries depleted that when killing was resumed on Copper Island in 1847 only 900 skins were taken, while on Bering Island, which got an additional year of grace, the yield in 1848 was less than 450 skins. From this time until the end of the régime of the Russian-American Company the yield of the Commander Islands was very insignificant. It is true, the reports were in 1859 that the rookeries were again crowded, a condition evidently due to the improved methods, especially the prohibition of killing the females, but as the Pribilof Islands showed the same favorable conditions and could easily supply the demand, there was no inducement for the chief management in Sitka to incur the increased labor and risk at the more distant islands, and it is probable that the Commander Islands were only worked enough to supply the kind and quantity of skins demanded for the Siberian (Kiakhta) trade, a comparatively insignificant amount (5,000 to 6,000 a year).

In a general way the condition of affairs on the Commander Islands during this period must have been very similar to that on the Pribilofs, though from their remoteness from the seat of the general management and their comparative insignificance the criticisms of the company's dealings which were current probably applied with still greater force to the Commander Islands.

Once a year the islands had communication with the outer world. A small vessel brought supplies, etc., from Sitka and carried away the dried skins.[1] In the earlier days, after the recolonization of the islands, the skins were apparently shipped to one of the ports in the Okhotsk Sea, but this was changed later, so that all the furs were first sent to Sitka, whence they were reshipped the following year. This method, however, involving additional cost and risk, was discontinued in 1854, and the vessel which brought the supplies and inspectors was henceforth ordered to proceed with the skins to Ayan, on the Okhotsk Sea, by way of the Kuril district (Fur Seal Arb., VIII, p. 349). Occasionally some of the vessels of the semi-military navy of the campany would call at the islands on their cruises of protection against the foreign—chiefly American—fleets of whale ships which infested the waters in those days, and even landed on and raided the islands [1]

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[1] I am not aware that skins were ever salted on the Commander Islands during the time of the Russian-American Company.

When finally, in 1868, the Russian-American Company abandoned the management of the islands, the so called "interregnum" commenced. The islands were placed under the jurisdiction of the Petropaulski district, and the first thing Mr. F. Khmeleoski, the ispravnik, or official, of that place, did was to issue a proclamation declaring the natives to be free men [2] and giving them liberty and power to regulate all their affairs, including the catch of the fur-bearing animals. It seems that only a noncommissioned officer, Teterin, was left in charge.

Quite a number of foreign merchants, among them the Russian vice-consul at Honolulu, Mr. Pfluger, but mostly American citizens, prominent among whom was the so-called "Ice Company" of San Francisco, flocked to the islands, their schooners bringing all sorts of trade goods, necessities and luxuries of life—particularly the latter—and, not to be forgotten, plenty of alcohol. In return they brought away as many pelts as they could induce the natives to secure. The rivalry between the traders was very sharp, and the natives had high carnival most of the time as a consequence. Gambling and drinking prevailed to a fearful extent, and the natives were willing to sell anything and everything for whisky. The drunken debauches were carried on right on the rookeries, and it is authoritatively stated that, as the skins of the female seals were higher priced, because of their finer fur, quite a number of this class were slain. Besides, drunken men would not be very apt to discriminate as nicely as necessary to distinguish the females from the bachelors. It is also authoritatively asserted that a count of the skins taken was never kept, neither by the natives nor by the police authorities in Petropaulski. The figures presented elsewhere, giving the total export of skins for the period as from 60,000 to 65,000, are, therefore, only guesses, and are probably underestimated rather than overestimated. At least one of the vessels, with its valuable cargo of furs, was lost. As a result of this reckless slaughter the rookeries were nearly ruined in those three years.

In 1871 there was a wholesome awakening. Hutchinson, Kohl & Co., a San Francisco firm which had already acquired extensive property and trading rights in Alaska, had opened negotiations with the authorities at St. Petersburg for a lease of the islands on practically the same conditions upon which the Alaska Commercial Company leased the Pribilof Islands of the United States, and the contract was signed February 18, 1871, but was kept a profound secret until the following summer. In the meantime the Ice Company, ignorant of the lease and in anticipation of a profitable season, had dispatched a large cargo of merchandise to the islands. Shortly after the representative of the new company arrived with the lease and took possession. As the lease not only included the monopoly of taking the furs but also of trading with the natives, there was no other choice for the Ice Company but to sell out to its successful rival at a ruinous price. So well had the secret been kept that even the ispravnik at Petropaulski, who was still to retain jurisdiction over the islands, did not know of the lease and the impending change until it was presented to him by the company's representative alluded to.

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[1] Note, for instance, the case told by Tikhmenief (Istor. Oboz. Ross. Amer. Komp., II, p. 131?) to the effect that "in 1847 one of the whalers came to Bering Island, and on the captain being told that he must not capture sea lions on a neighboring small island [evidently Ari-Kamen], he ordered the overseer of the island to be turned off his ship, and immediately went on shore with his men with the evident intention of disregarding the prohibition. It was only when active steps were taken to resist them that the whalers left, but before going they cut down a plantation, which had been grown with great trouble, the island being without other trees or shrubs." It is curious to reflect that the British case at the Paris Tribunal has taken this incident as a proof that "traffic in fur-seal skins was carried on by a United States whaler at Bering Island" (Fur Seal Arb., IV, p. 66). There never were fur seals on the island referred to, though, on the contrary, it formerly abounded in sea lions (sivutch), the only animal mentioned by Tikhmenief.

[2] During the régime of the Russian-American Company the natives were practically serfs.

With the taking of possession by the new company a new order of things commenced. The firm's name was altered to Hutchinson, Kohl, Maksutof & Co., and later to Hutchinson, Kohl, Philippeus & Co. It had been necessary, in order to obtain the lease from the Russian authorities, to include at least one Russian subject in the firm, and Mr. Philippeus, a Russian merchant having great trading interests in Kamchatka and neighboring districts, was paid a considerable amount for the use of his name in this connection. Nominally, therefore, the company was Russian, but practically it was American. Their vessels were flying the Russian flag, but they were American property. In 1872 Hutchinson, Kohl & Co. sold their interest and property in Alaska to the Alaska Commercial Company of San Francisco, members of which also acquired a controlling interest in the Russian company. From that time on until the expiration of the lease in February, 1891, the management of the company's affairs on the Commander Islands and Tiuleni Island were in the hands of the celebrated firm, with headquarters at 310 Sansome street, San Francisco.

The management now became practically identical with that on the Pribilofs, and an employee from the latter, Capt. D. Webster, was sent over to the Commander Islands to teach the natives the improved methods of taking the seals and curing the skins adopted on the former. It is, therefore, unnecessary to go into details concerning this part of the industry, which has been described so often in connection with the Pribilof Islands.

The affairs as I found them in 1882 were managed in the following way:

On each island there was a local agent and storekeeper,[1] who had general charge of affairs, except the management of the taking of the skins, and who kept the books and accounts. The sealing business proper was attended to by a sealer for each rookery, who accepted the skins brought by the natives to the salt house door and superintended the salting, bundling, etc. During this period these overseers were not natives, except Mr. Fedor Volokitin, a "creole," who represented the company at the south rookery, Bering Island. The general management of the business was in the hands of Mr. John Sandman, the captain of the company's steamer *Aleksander II.*

Practically the whole administration of the business rested with the company, not even a maximum limit as to the number of skins to be taken being contained in the lease. The function of the Government official stationed on the islands was chiefly confined to seeing that the company did not overstep its contract, that the regulations for the protection of the seals, as well of the natives, were enforced, to supervise the killing, keep account of the number of skins taken, to receive and distribute the money for the skins to the natives, etc.

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[1] On *Copper Island:* Mr. Alexander Kostromitinof, who succeeded Mr. C. F. Emil Krebs. The latter served from 1871 to 1881. Mr. Emil Kluge followed after Mr. Kostromitinof until the fall of 1894, when he was succeeded by Mr. A. Cantor.

On *Bering Island:* Mr. George Chernick. He died on the island in the fall of 1887, Mr. F. Volokitin tending the station during the following winter. In the spring of 1888 Mr. Kostromitinof was transferred from Copper Island, being relieved in 1890 by Mr. Julius Lindquist. He was succeeded in about a year by Mr. Waldemar Paetz, of St. Petersburg, whose term expired in 1895, Mr. Emil Kluge being then transferred from Copper Island.

The skins were taken by the company's steamer from the islands to Petropaulski in instalments and there reloaded before shipment to San Francisco. One of the reasons for this arrangement was that Petropaulski is the only port of entry in that part of the Russian Empire, and as the skins were to be shipped to San Francisco, a foreign port, clearance paper had to be obtained in Petropauiski, while at the same time the insurance companies would only assume the risk from the sailing from the latter port. At this place, therefore, Hutchinson, Kohl, Philippeus & Co. maintained quite an extensive establishment. Large warehouses and a wharf were built on the spit in the outer harbor near the extreme end of the Nikolski peninsula, while in the town itself a large and commodious house for the accommodation of the resident agent and his family was erected.

This position as resident general agent in Petropaulski was held to the expiration of the term of Hutchinson, Kohl, Philippeus & Co. by Mr. Joseph Lugebil, who extended the company's hospitality in a manner pleasantly remembered by all who had the good fortune to visit Petropaulski during that period.

Under the lease the company was to keep a general store for the sale of articles of food, clothing, etc., to the natives on each of the Commander Islands. The merchandise was imported free of duty, but the company was only allowed to charge San Francisco wholesale prices plus a certain fixed percentage as compensation for freighting and storing the goods. The company decided about the kind and quantity of goods to be brought, while the administrator appointed by the Government saw to it that the prices charged were not in excess of the contract and that the quality of the goods was satisfactory.

The original lease stipulated a price of 2 silver rubles ($1.33) per skin accepted by the company, but in a subsequent supplementary contract of March 9, 1871, the tax, from 1877 on, was reduced to 1.75 rubles ($1.17) for the first 30,000 skins. The natives received for their work 1 ruble (66⅔ cents) per skin for the first 30,000 and one-half ruble (33⅓ cents) for each skin over 30,000. The company had to pay a yearly rental of 5,000 rubles and to contribute a considerable amount toward the support of the natives.[1]

There being no serviceable buildings left by the old company, Hutchinson, Kohl, Philippeus & Co. had to build a number of houses on both islands to accommodate their goods and their men. Salt houses were erected on all the rookeries, and near each a small frame hut for occupancy by the company's "sealer" during the killing season. In the main village on Bering Island several large stores and warehouses, a cow stable, boathouse, bath house, besides two dwelling houses, were built, as well as similar though somewhat smaller structures in the main village on Copper Island. These are all frame houses, built of California or Puget Sound lumber by an American head carpenter with the assistance of native workmen.

Although under no legal obligation to do so, the company gradually built and presented to nearly all the families on both islands commodious frame houses, mostly with 4 rooms, similarly built, the natives receiving full title to them.

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[1] The text of the contract, with supplement, is printed in Sbornik Glavn. Off. Dokum. Upravl. Vost. Sibir., III, ii, Append., pp. 1-8. Also in Savitch, Otchet, etc., App. No. 5.

By careful management the seal rookeries, which at the beginning of the company's term scarcely yielded 30,000 skins annually, toward the end produced about 50,000 a year, the annual average between 1880 and 1889 being nearly 45,000. Among the entries in the diaries of the company's agents during this period are many like the following: "Natives say there are a good many female seals this year, and holostiaks, too" (Bering Island, July 23, 1877). "Assistant Starshena (chief) has been on south rookery; reports that both holostiaks and females are double in quantity as has been before, but not many old bulls. On the north rookery there are more seals, too" (Bering Island, August 12, 1877.) "Natives report good many thousand seals more this year than ever before" (Bering Island, August 2, 1880).

The lease of Hutchinson, Kohl, Philippeus & Co. expired in February, 1891, and as the new lease was awarded to a new company, the old company's steamer *Aleksander II* was sent early in the year to take off the fall catch of 1890, consisting of 5,800 skins.

The new company, into the hands of which the sealing industry of the Commander Islands and Tiuleni now passed, was incorporated in St. Petersburg under the name "Russkoye Tovarishtchestvo Kotikovikh Promislof,"[1] or the "Russian Seal Skin Company," as the name of the firm is officially rendered in English.

By the new contract, which is only for 10 years from February 19, 1891, to February 19, 1901 (old style),[2] the mutual relationship of the Government, the natives, and the company was materially changed, considerable power being placed in the hands of the administrator, while the direct dealings of the company with the natives were greatly reduced. The gradual americanization of the natives under the régime of Hutchinson, Kohl, Philippeus & Co. was undoubtedly distasteful to at least one of the inspectors, whose opinion with the St. Petersburg authorities must have been of great weight, as there is now a manifest tendency toward a rerussification of the business and its methods.

The tax to be paid for skins was raised considerably. Under the present contract the company pays to the Russian Government 10.38 "metallic" rubles (gold) per skin taken, one-half to be paid in St. Petersburg in the month of May, in advance of the sealing season. This advance payment, from 1891 to 1894, was made on a basis of 50,000 skins to be taken. In the meantime Russia had agreed with England not to take more than 30,000 skins a year; hence from 1895 the advance payment was made on a basis of only 30,000 skins. The other half is paid at the end of the season, when the amount of the catch is known. The amount which the Russian Government pays the natives for their work, 1.50 rubles per skin, is usually paid at the islands by the company at the end of the season and deducted from the draft of the balance due in St. Petersburg. It will be seen that by this arrangement the Russian Government is amply protected, but in addition the company is obliged to deposit Imperial Russian bonds with the Government in St. Petersburg to an amount equaling that of the advance payment.

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[1] Russian Company for Fur-Seal Hunting (lit. transl.).

[2] The text of the contract with the title *Kontrakt na sdatchu f arendu "Russkomu Torarishtchestvu Kotikovikh Promislof" pushnikh promislof na Ostrovakh Komanddorskikh i Tiuleniem* has been separately printed. Fol. 4 pp. *Tipografia V. Kirschbauma* [St. Petersburg].—Also in Savitch, Otchet, App. No. 7.

The entire sealing business is exclusively in the hands of the local administration, and the company has nothing further to do with it but to receive the skins at the side of the vessel, except that it accepts or rejects the skins immediately upon their being brought from the killing grounds and superintends the salting of the skins, for which purpose it also furnishes the salt. The administrator, therefore, has unlimited power to determine how many seals are to be taken, and also how, when, where, and by whom they are to be taken. The Government undertakes the driving, killing, skinning, salting, bundling, and delivery. The administration takes the temporary receipt for the skins issued by the company's overseer at the salt houses and finally the agent's receipt when the skins are received on board the company's vessel. The skins are then brought to Petropaulski, where the ispravnik can not give clearance papers without first receiving the certificate of the administrator of the islands that the company has complied with the Government requirements.

Like Hutchinson, Kohl, Philippeus & Co., whose establishments both on the islands and in Petropaulski the Russian Seal Skin Company acquired, the latter has the exclusive right to keep a store on each island in which to sell to the natives such staples and articles as are necessary for their existence and comfort. The company is not allowed to bring such articles as it may deem thus necessary, but the administrator each year makes out a detailed list of quantities and qualities, specified in the minutest details, which goods the company, upon his requisition, are obliged to bring during the year and to sell to the natives at a certain stipulated percentage over the certified market price, the Government showing a decided preference for Russian goods. Should any of the goods thus ordered remain unsold on the company's hands, the loss falls upon the company. As a rule the company sells for cash to the natives, unless the administrator expressly authorizes a family head to take goods on credit, in which individual case the amount is specifically limited. At the first distribution of money for work or furs the amount is paid and the debt canceled before new sales can be made.

For the privilege of thus trading the company has to pay all the various license and guild fees to which the Russian merchants are liable, in this case amounting to many hundred rubles.

The carrying of supplies and skins is done by the company's steel steamer *Kotik* (272 reg. tons net; 400 tons gr.), Capt. C. E. Lindquist (pl. 66, fig. *a*).

Like the Alaska seal skins, nearly all the Commander Island skins are sold at auction in London, where they are known as Copper Island skins.

I append the following table by Mr. Alfred Fraser, showing the sales and prices of Commander Island skins in London since 1870 (Fur Seal Arb., IX, p. 576). The figures since 1892 were kindly furnished by Mr. Fraser in letter of February 15, 1897.

Salted Copper Island fur-seal skins sold in London in the years 1870 to 1896.

Year.	Skins.	Average price per skin.		Year.	Skins.	Average price per skin.	
		s.	d.			s.	d.
1870	12,030	18	8	1885	48,929	37	0
1871	9,522	21	4	1886	41,752	40	0
1872	7,182	33	9	1887	54,584	40	0
1873	21,614	36	0	1888	46,333	38	3
1874	30,349	40	0	1889	47.416	50	6
1875	34,479	41	0	1890	95,486	72	1
1876	33,298	24	10	1891	17,025	64	8
1877	25,380	26	6	1892	30,678	58	6
1878	19,000	88	6	1893	32,832	71	10
1879	28,211	57	6	1894	27,298	57	0
1880	38,885	80	0	1895	17.721	54	0
1881	45,209	60	0	1896	14,415	45	2
1882	39,111	45	6				
1883	36,500	38	3	Total	881,914		
1884	26,675	59	0				

STATISTICS.

Having thus given a brief résumé of the history of the fur-seal industry on the Russian side, as it is revealed in the scanty records, it may be well to present, in chronological order, such statistics as I have been able to bring together showing the number of fur seals taken at various times on the Commander Islands. Unfortunately, many of the figures submitted are only hypothetical, some even highly problematical, but I have accompanied them with a running comment which it is hoped is sufficiently explicit to show how the estimates were made.

It is not probable that any great slaughter of the fur seals took place during the first period. Bassof and Trapeznikof returned from the Commander Islands in 1746 with a cargo of furs, among which are mentioned 2,000 fur seals (Bancroft, Works, XXXIII, p. 100), but in the returns of the other expeditions between 1743 and 1750 no other mention of seal skins is made. As sea otters and blue foxes are mentioned frequently, it is evident that the fur-seal skins were of but little importance and value. It is also probable that in those days only the pups were taken, for it is specifically stated that Yugof's cargo of fur seals, when the vessel returned in 1754 from Copper Island, consisted of 1,765 black pups and 447 gray ones (Neue Nachr. Neuent. Ins., 1776, p. 22). Tolstykh, likewise, in 1750 returned from Bering Island with 840 "young fur seal skins or *kotiki*" (*ibid.*, p. 26), and Vorobief in 1752 is said to have brought to Kamchatka, probably from the Commander Islands, "5,700 black and 1,310 gray young fur seals or *kotiki*" (*ibid.*, p. 27). Drushinin in 1755 returned with 2,500 seals taken on Bering Island (*ibid.*, p. 32). These, as well as the 2,000 brought by the *Vladimir* in 1767 and the 630 in Popof's *Ioann Pretecha* in 1772, were also probably young.

As I have shown elsewhere (Amer. Natural., XXI, Dec., 1887, p. 1053), the sea cow on the Commander Islands had become nearly extinct in 1763. The sea otter had also been killed off there to such an extent that the hunt had become unprofitable, and the blue foxes likewise. As the fur-seal skins were of comparatively little value, there were no inducements for the fur hunters to visit the islands after that time as frequently as before. It is certain enough, as shown above, that the fur seals had not left the Commander Islands, or become nearly extinct there, as alleged by Elliott, as there are records of vessels having actually visited the islands between 1760 and 1786, bringing plenty of seal skins back. As a matter of fact, it was during this very period that the heaviest slaughter of fur seals took place on the Commander Islands. It appears that Shelikof was the first trader to deal extensively in fur seals, and his name is not mentioned until 1776. It is stated that up to 1780, consequently in four years, he had imported 70,000 fur-seal skins. It is furthermore stated that his vessel, *Sv. Ioann Rylskoi*, returned in 1786 with 18,000 fur seals. In the same year Protassof returned with a "cargo consisting chiefly of fur seals." Panof's vessel, *Sv. Georgi*, which also returned in 1786, had less luck, having secured only 1,000 seal skins. As the Pribylof Islands were not discovered until that year (the first cargo from there did not arrive in Okhotsk until 1789), the bulk of the fur-seal skins brought to Kamchatka must have come from Commander Islands (see Bancroft, Works, XXXIII, pp. 185-191). There is *record* of about 100,000 skins having been taken between 1760 and 1786, while from 1746 to 1760 the skins brought to Kamchatka probably did not exceed 20,000.

For the early times, between the return of the first cargo from the Pribilof Islands to 1841, the year of the expiration of the second term of the Russian-American Company, there are absolutely no accessible records as to the number of seals taken at or shipped from the Commander Islands. Elliott states (Monogr. Pribyl. Group, p. 70) that from 1797 to 1861 the statistics of skins taken from the Pribylof Islands include "about 5,000 annually from the Commander Islands," but I have reasons for believing that this statement is erroneous. As I have shown elsewhere, there was no regular population on the Commander Islands until after 1826, and as vessels touched at the islands at great intervals only, an annual catch of 5,000 skins from the Commander Islands is out of the question. This is also plain from the figures given by Veniaminof and Von Wrangell. The former, according to the table presented by the British Bering Sea commissioners (Rep., p. 132), gives the total number of seals killed on the Pribylof Islands from 1826 to 1832, inclusive, as 137,503. This agrees fairly well with the statement by Baron von Wrangell, the chief manager of the Russian-American Company during that period, that the total number of skins exported from the colonies from 1827 to 1833 amounted to 132,160. This number is clearly meant to include all the skins exported from the whole colony, and would include any and all from the Commander Islands, if skins were taken there, for he expressly remarks that his statistical figures date from the incorporation of the Atkha district, which included the Commander Islands, under the colonial management (Stat. Ethn. Nachr. Russ. Besitz. Nordwestk. Amer., p. 24).

The fact that the Commander Islands were not subject to the central management located at Sitka until 1826 leads me to believe that the few Commander Islands skins taken are not reported in the figures before that date, but that they were received direct either at Petropaulski or Okhotsk.[1]

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[1] To show how very unsatisfactory the statistical figures of the early days as collated by the British Bering Sea Commission are, I may mention that they estimate the number of fur seals killed on the Pribylof Islands from 1786 to 1833, inclusive, as follows:

1786 (according to Shelikof)	40,000
1787-1806 (Rezanof's estimate)	1,000,000
1807-1816 (approximated from Tikhmenief at 47,500 annually)	475,000
1817-1833 (Veniaminof)	543,239
Total, 1786-1833	2,058,239

This number is 1,120,323 skins short, for Baron von Wrangell, who undoubtedly had pretty reliable information to go by, states that "since the discovery of the islands St. Paul and St. George, But even Veniaminof's figures are not beyond suspicion. In his "Zapiski," published in St. Petersburg in 1840, vol. I, chap. XII, he writes as follows (according to Elliott, Monogr., p. 165): "The company on the island of St. Paul killed from 60,000 to 80,000 fur seals per annum, but in the last time (1833?) [Elliott's interpolation], with all possible care in getting them, they took only 12,000. On the island of St. George, instead of getting 40,000 or 35,000, only 1,300 were killed." Now, if we examine the table of his figures, as presented by Elliott (Monogr., p. 143), we find no year between 1817 and 1837 in which 12,000 seals were taken on St. Paul (13,200 in 1833), nor 1,300 on St. George.

While thus the figures relating to the Pribilof Islands are dubious and unsatisfactory, there are next to no records in regard to the catch on the Commander Islands between 1787 and 1841. In fact, there is hardly a scrap of available history to be found on the subject during that period.

There is no reason to doubt, however, that the slaughter of the fur seals on the Commander Islands after 1787 was as enormous as on the Pribilofs, proportionately (where, according to my calculation, the average annual killing was 86,511).[1] The result of this *indiscriminate* wholesale slaughter undoubtedly brought the rookeries to a very low ebb, for we find the Commander Islands practically abandoned shortly after the establishment of the Russian-American Company, and a permanent population was not again established until after 1826, by which time the rookeries must have recuperated to some extent. The same old method of killing the young ones, and not even sparing the females, must soon have brought on the inevitable result of depletion, for we find that the chief manager of the colonies, Capt. I. A. Kuprianof, as early as 1839, had conferred with the baidar-steerer Shayashnikof as to when, in his opinion, it would be possible to begin taking a full catch on St. Paul Island in order to *establish a close time for sealing on* St. George and *the Commander Islands*, and that Captain Etholin, his successor as chief manager, in 1842 asked permission to institute a close season on the Commander Islands, a permission that was granted the following year (Fur Seal Arb., XVI, pp. 76, 114).[2] This rest lasted apparently to 1847.

Shortly after, the prohibition to kill females was enforced, and as a result of both measures the seals were again increasing, so that in 1859 the chief manager could

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from the year 1786 to 1833, 3,178,562 fur seals were killed *there*" (Stat. Ethn. Nachr. Russ. Am., p. 48). These I should be inclined to distribute as follows:

Fur seals killed on St. Paul Island, 1786–1833:

1786 (according to Shelikof)	40,000
1787–1798	1,095,467
1799–1816 (Bancroft's figures from 1799–1821, 1,767,340, minus Veniaminof's figures from 1817–1821, 267,484)	1,499,856
1817–1833 (Veniaminof)	543,239
Total (=Von Wrangell's figure)	3,178,562

In the same table and report it is stated (p. 133) how the figures for the years 1861 and 1862 are obtained: "1861.—Bancroft's total for years 1842–1861 (both inclusive) is 338,600. The total for years 1842–1860 (both inclusive) is 308,901. This being deducted from total for 1842–1861 gives the number of seals taken in 1861." In their table, however, the total for 1842–1860 is not 308,901, but 318,901.

[1] Not only were females and pups killed, but the "bulls and young bulls" also, for in spite of their coarse hair the Chinese at Kiakhta paid high prices for them (Fur Seal Arb., VII, p. 165).

[2] Figures representing the catch during the Russian-American Company's terms are given in the final table of shipments by periods.

write to St. Petersburg that according to the reports of the officials of "even those of the Commander Islands, the seals have increased in numbers on all accessible places to such an extent that the areas occupied by them appear crowded." It is evident, however, that the managers proceeded with caution, notwithstanding, for in the years from 1861 to 1867, the year of the final dissolution of the Russian-American Company, only 4,000 to 5,000 seals (gray pups) a year are said to have been taken. These figures are from the following table, which is copied from the report of the British Bering Sea commissioners (p. 214), those from 1865 being official:

Skins taken for shipment from Commander Islands, 1862-1867, by the Russian-American Company after the expiration of its third term.

Notes.	Year.	Number.
Only gray pups killed	1862	4,000
Do	1863	4,500
Do	1864	5,000
Do	1865	4,000
Do	1866	4,000
Do	1867	4,000
Total		[1] 25,500

This taking of gray pups only on the Commander Islands is very curious in view of the difficulty the company had only a few years previously in disposing of such skins and its attempt to stop taking them at all on the Pribilof Islands.[2] The 4,000 gray pups were probably only taken for natives' winter food as was the similar quantity (3,000-5,000) on the Pribilofs (Fur Seal Arb., I, pp. 84-85).

The table of the British commissioners in the note says "including Robben Island," but no skins were regularly taken there in those days.

During the so-called "interregnum"—that is, the years 1868-1870, inclusive—from the time the Russian-American Company abandoned the management of the islands until Hutchinson, Kohl, Philippeus & Co. assumed control, no restrictions except such as the natives themselves might impose and enforce were placed upon the slaughter, which in these three years averaged about 20,000 annually. The seals taken up to that time were exclusively gray pups, but during the interregnum at least one of the traders, viz, Mr. J. Malovanski, had become aware of the increased demand and higher prices for bachelor seals, and he consequently induced the natives to bring him skins of the latter. However, of the 60,000 killed, a great many must have been young ones, but the proportion between the two classes will probably never be known. Four sets of figures are given for the catch in these three years, as follows:

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[1] In Nordenskiöld's "Voyage of the Vega," Am. ed., p. 609, there is a table of figures relating to the catch of seals on the Commander Islands involving several errors. Aside from the fact that it purports to give the catch on Bering Island only, while in reality the figures represent the catch on both Bering and Copper islands, it gives the catch for the year 1867 as 27,500 seals. Here is apparently a double error. Compared with the corrected figures given by Elliott (Monogr., p. 113), 27,500, is evidently meant to include the catch from 1862 to 1867, inclusive, in which case, however, the statement is 2,000 too high.

[2] "At the same time the board of administration places upon the men in charge of sealing gangs the strictest injunctions to discontinue the killing of such gray seals, and in no case to ship them away from the colonies, since they seriously interfere with profitable sales of fur seals in Russia and in foreign markets where only the larger skins secure good prices." Letter (No. 26.) from Board of Administration to Chief Manager Voyevorski, dated St. Petersburg, June 5, 1857 (Fur Seal Arb., I, App., p. 84).

Year.	Elliott (Monograph, p. 113).	Niebaum (Fur Seal Arbitration, III, p. 202).	British Bering Sea commissioners (Rep., p. 214).	Savitch (Otchet, 1893, p. 14).		
				Bering Island.	Copper Island.	Both.
	Number.	*Number.*	*Number.*	*Number.*	*Number.*	*Number.*
1868	12,000	*15,000	12,000	6,730	9,000	15,730
1869	24,000	20,000	21,000	14,100	10,000	24,100
1870	24,000	30,000	27,500	15,500	12,000	27,500
Total	60,000	65,000	60,500	36,330	31,000	67,330

* About.

It is doubtful whether any of these figures are exact, but as they agree pretty well, and as the third set represents the official figures of the Russian administrator, they may be taken as authentic.[1]

Upon the arrival on the scene of the agents of Hutchinson, Kohl, Philippeus & Co., in 1871, it was found that the *indiscriminate* slaughter during these three years had again done sensible injury to the rookeries. Says Mr. C. F. Emil Krebs, who stayed on Copper Island from 1871 to 1881 (Fur Seal Arb., III, p. 195):

> Upon my arrival at the island, in 1871, the native chief told me that the seals were not as plentiful as they had been formerly. I announced that we intended to secure 6,000 skins that year. They protested that it was too many, and begged that a smaller number be killed for one year at least. We, however, got the 6,000 skins, as proposed,[2] and an almost constantly increasing number in every subsequent year as long as I stayed on the islands, until in 1880 the rookeries had so developed that about 30,000 skins were taken, without in the least injuring them.

The history of the gradual increase of the yield of the rookeries during the following twenty years, and the subsequent decrease until the present day, is plainly shown in the following tables. It should be remarked that the lower figures of 1876, 1877, and 1883 are due not to a lack of seals on the rookeries, but to the fact that the company did not desire more (in 1883, in fact, not as many as they were obliged to take).[3] The following comparison of the Commander Islands and Tiuleni catches with those of the Pribilof Islands demonstrates the correctness of this statement:

Comparison of the catches at Commander Islands and Tiuleni with those at Pribilof Islands.

Year.	Commander Islands and Tiuleni.	Pribilof Islands.	Year.	Commander Islands and Tiuleni.	Pribilof Islands.
	Skins.	*Skins.*		*Skins.*	*Skins.*
1874	31,300	107,932	1880	48,504	100,634
1875	36,279	101,249	1881	43,522	101,734
1876	26,960	89,478	1882	44,620	101,736
1877	21,533	77,956	1883	28,690	77,063
1878	31,340	101,394	1884	53,263	101,013
1879	42,740	106,908			

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[1] I may here correct a mistake in the oft-mentioned table presented by the British Bering Sea commissioners (Rep., p. 214). They run a line between the years 1869 and 1870 and mark it "Alaska Commercial Company's first term began." As a matter of fact the term (and *only* term) of Hutchinson, Kohl, Philippeus & Co., the term and company meant, did not begin until 1871, and the catch of 27,500 skins during 1870 is, therefore, to be credited to the merchants trading during the interregnum.

[2] Only 3,614 of that number were shipped in 1871; the remainder in 1872.

[3] In corroboration of this statement I may quote the one by Moxon that "Messrs. Lampson in the catalogue of March, 1893, placed a notice in red ink to the effect that the catch would in the coming season be reduced by 40,000 skins." (Fur Seal Arb., VIII, p. 869.) As a matter of fact, the reduction effected by the company amounted to exactly 40,594 skins.

There are a number of published statements referring to the seal catch on the Commander Islands since 1871, but none of them are complete, nor are the figures given for the separate islands. The figures also vary to some extent, for several reasons. In some cases the Tiuleni Island skins have been counted in with those of the Commander Islands. Thus, in Capt. G. Niebaum's statement (Fur Seal Arb., III, p. 204), by inadvertence the number of killed seals for 1890, 53,780, includes 1,456 skins from Tiuleni, the total for the Commander Islands being only 52,324. Many other discrepancies are explained by the fact that the various figures refer to various counts. Some may and do refer to skins shipped, others to seals killed, others to skins accepted and paid for. The almost unavoidable difference in the counting of such large quantities of skins is manifest when we remember that the skins are first counted at the salt house and then again as they go over the ship's side into the hull. Upon these counts the official Government statement is made up. The skins are then unloaded in Petropaulski, again loaded into the steamer, and again unloaded and counted in San Francisco. It is, therefore, not to be expected that lists made up from the various figures in the island count, the ship's count, and the custom-house count would agree exactly. The figures given in the following table are based chiefly upon the various station journals as well as the ships' logs, partly upon the figures already published and partly upon a list showing the number of seals shipped between 1883 and 1891 from Bering and Copper islands separately, kindly furnished by Mr. Max Heilbronner, of the Alaska Commercial Company:

Number of fur-seal skins shipped from Commander Islands and Robben Island from 1871 to 1897, inclusive.

Year.	Bering Island.	Copper Island.	Robben Island.	Total.
1871	0	3,658	0	3,658
1872	14,392	14,964	0	29,356
1873	13,044	14,661	2,694	30,399
1874	13,406	15,480	2,414	31,300
1875	12,712	20,440	3,127	36,279
1876	10,358	15,074	1,528	26,960
1877	7,192	11,392	2,949	21,533
1878	8,130	20,070	3,140	31,340
1879	13,572	25,166	4,002	42,740
1880	15,160	30,014	3,330	48,504
1881	16,078	23,237	4,207	43,522
1882	18,512	22,002	4.106	44,620
1883	13,480	13,170	2,049	28,699
1884	21.384	28,060	3,819	53,263
1885	20,966	20,771	1,838	43,575
1886	24,555	30,036	0	54,591
1887	21,298	25,049	0	46,347
1888	26,456	20,906	0	47,362
1889	23,783	29,076	0	52,859
1890	19,996	32,328	1,456	53,780
1891	* 17,884	† 18,065	540	36,905
1892	16,590	14,654	0	31,244
1893	13,992	17,294	1,532	32,818
1894	13,165	13,122	1,000	27,287
1895	9,526	6,893	1,300	17,719
1896	7,301	7,171	269	14,741
Total	392,932	402,753	45,300	930,985

* Of these, Hutchinson, Kohl, Philippeus & Co. shipped 4,059; the Russian Seal Skin Co. shipped 13,825.
† Of these, Hutchinson, Kohl, Philippeus & Co. shipped 1,741; the Russian Seal Skin Co. shipped 16,324.

To this total should be added 416 skins taken from the schooner *J. H. Lewis*, seized in 1891, and 2,152 skins taken in 1892 from the seized schooners, which obtained them chiefly off Copper Island. The latter skins were sold by the Russian Government, part in Petropaulski (1,124), part in London, and were shipped in the company's steamer to San Francisco (see Fur Seal Arb., VII, pp. 375, 417). The total number of skins shipped from the Russian seal islands from 1871 to 1896, inclusive, is, therefore, 933,553.

That this list does not give an accurate idea of the number of seals killed in each particular year is clear from the fact that the fall catch of the year is not shipped until the following summer. In some years there was no fall catch at all; in others it was very considerable. Thus, for instance, in 1871, the first year of the lease of

Hutchinson, Kohl, Philippeus & Co., no less than 10,500 seals were killed on both islands, of which, however, only 3,658 were shipped from Copper Island (the island count, or 3,614 by the San Francisco count), while none at all were shipped from Bering Island. Full data of the actual number of seals killed in each year are not at hand, but the following table, based upon data furnished me by the late Mr. G. Chernick, then station keeper on Bering Island, may serve as an indication of the difference between a list of seals killed and one of skins shipped:

Seals killed and skins shipped from Bering Island, 1871–1882.

Killed.				Shipped.	
Year.	Total.	Summer.	Fall.	Skins.	Year.
1871	4,500	....	....		
1872	12,912	9,892	3,020	14,392	1872
1873	13,040	10,024	3,016	13,044	1873
1874	13,034	10,390	2,644	13,406	1874
1875	11,790	10,068	1,722	12,712	1875
1876	9,822	8,636	1,186	10,358	1876
1877	6,006	6,006	....	7,192	1877
1878	8,674	8,130	544	8,130	1878
1879	13,028	13,028	....	13,572	1879
1880	15,160	15,160	....	15,160	1880
1881	16,078	16,078	....	16,078	1881
1882	18,512	18,512	....	18,512	1882

It must be remembered, however, that these figures only represent the number of skins accepted by the company, and not the actual number of seals killed, as many skins, oversized, undersized, and damaged in many ways, are left with the natives, the company being very particular in their selection, at least during the years of plenty. The actual number of these rejected skins is difficult to get at for the earlier years, but as an example I append the following table, the data of which are taken from an article in the Viestnik Rybopromyshlennosti for 1892:

Seals killed on the Commander Islands in 1889.

	Bering Island.	Copper Island.	Total.
Summer:			
Bachelors	20,536	28,934	49,470
Bulls	53	253	306
Females	63	76	139
Pups	150	142	292
Fall:			
Bachelors	1,366	1,459	2,825
Total	22,168	30,864	53,032

It would have been interesting and instructive to have a list of skins taken from each rookery for a considerable length of time. but I have been unable to obtain the necessary data. The following table, however, furnishes this information for the years 1891 to 1897:

Fur seals killed on the Commander Islands, 1891–1897.

Locality and season.	1891.	1892.	1893.	1894.	1895.	1896.	1897.
Bering Island:							
Summer—							
North rookery	13,177	16,171	12,156	12,516	8,370	6,098	4,873
South rookery	648	419	327	627	564	537	153
Fall				592			
North rookery		1,422			360	670	
South rookery		87	22		103		
Copper Island:							
Summer					6,396		
Karabelni	3,664	4,552	5,343	4,268		2,256	1,329
Glinka	12,660	10,102	10,938	8,387		4,625	4,976
Fall				497			
Karabelni		451	86		47	236	
Glinka		502	381		216	524	
Total	30,149	33,766	29,253	26,887	16,056	14,946	11,335

Even in this table the figures represent only accepted skins, except those of the last three years.

Shipment of skins from the Commander Islands (exclusive of Robben Island), by periods.

1746 to 1760, 15 years (period of plenty of sea-otters, foxes, and sea-cows), annual average about 1,333 .... total about..	20,000
1761 to 1786, 16 years (other fur-bearing animals becoming scarce and sea-cow exterminated), annual average about 6,250 .... total about..	100,000
1787 to 1798, 12 years (from discovery of Pribylof Islands to Russian-American Company), same annual average .... total in round figures about..	50,000
1799 to 1826, 28 years (from Russian-American Company to establishment of Atkha district), annual average about 476; total in round figures about.	15,000
1827 to 1841, 15 years (to expiration of Russian-American Company's second term), yearly average about 10,000 .... or total about..	150,000
1842 to 1861, 20 years (Russian-American Company's third term), yearly average 1,559 .... total about..	31,181
1862 to 1867, 6 years (hold-over of Russian-American Company), yearly average 4,250 .... total about..	25,500
1868 to 1870, 3 years (interregnum), yearly average 20,166 .... total about..	60,500
1871 to 1891, 20 years (lease of Hutchinson, Kohl, Philippeus & Co.), yearly average 36,791 .... total..	735,828
1891 to 1896, 6 years (lease of Russian Seal Skin Company to date), yearly average 24,976 .... total..	149,857
Skins seized within territorial waters, 1891 and 1892	2,568
Grand total .... about..	1,340,434

As previously stated, some of these figures do not pretend to be more than guesses. Most of them are explained in the foregoing pages, but the figures for the years from 1787 to 1841 need some explanatory remarks as to how these guesses were made.

From 1787 to 1798, inclusive, 12 years, I have assumed the annual average to have equaled that of the foregoing 26 years, giving 46,152, or, in round figures, 50,000.

From 1799 to 1826, the period of 28 years during the lease of the Russian-American Company, when the yield was not sufficient to induce the company to establish settlements on the islands, I have assumed that the annual average can not have exceeded the yield between 1842 and 1861, when the company still maintained the settlements, or, in round figures, 15,000.

For the 15 years from 1827 to 1841, inclusive, I have made the following guess: Assuming that Wrangell at the end of 1833 had 30,000 skins on hand, about 25,000, or 4,166 annually[1] (Wrangell shipped, 1827–1833, 132,160 + assumed surplus on hand, 30,000=162,000 – Veniaminof's figures for killed seals on Pribilofs in years 1826–1832, 137,503=24,658), must have been taken on the Commander Islands from 1827 to 1832, inclusive. In 1840 the Russians had a demand for not over 30,000 skins annually (Simpson, Overl. Journ., p. 131). Probably they were nearly able to fill it, for Mr. E. Teichmann states (Fur Seal Arb., III, p. 579) that "up to the year 1853 about 20,000 skins were annually received in London" from the Russian-American Company. It is probably safe to assume, then, that 6,000 went to Kiakhta. Now, during the nine years from 1833 to 1841, inclusive, the Pribilof Islands yielded only 80,135. The assumed sale being 234,000 skins, and there being only 30,000 on hand and 80,000 killed on the Pribilofs, it follows that a yearly average of about 14,000 would have to be obtained on the Commander Islands, or about 125,000, to which should be added the 25,000 assumed to have been taken from 1827 to 1833, giving a total of 150,000.[2]

The only figures relating directly to the yield of the Commander Islands during this period are those by Tikhmenief, that there were exported from Bering Island during the third term of the Russian-American Company 9,526 fur-seal skins (Istor. Oboz. Obraz. Ross.-Amer. Komp., II, p. 296), as well as a corresponding list for both islands given by Savitch (Otchet, 1893, p. 11). It will be seen that the number of skins taken on Bering Island between 1847 and 1860 is given by the latter as exactly

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[1] This agrees pretty well with Lütke's statement that the yield on the Commander Islands about that time was only 5,000 skins (Voy. aut. Monde, I, p. 276).

[2] Figures thus obtained do not pretend to any accuracy. How misleading the process may be is clearly illustrated in the table presented by the British Bering Sea commissioners (Rep., p. 132) and the explanation concerning the sources of information. They utilize the total given by Bancroft for 1842–1861, viz, 338,600 (the identical figures utilized above), and from this deduct the number of skins taken from 1842 to 1860, according to a different source, thus obtaining the number taken in 1861. Correcting an apparent error in the subtractor, the number for 1861 would be 19,699. October 14, 1861, the chief manager of the colonies, Furuhielm, writes home to the board of administration that "in the course of this year 47,940 seal skins have been taken from the islands of St. Paul and St. George." 19,699 calculated, but 47,940 taken! This is a sad commentary upon the probable accuracy of the calculated figures.

9,526. It would therefore appear that no skins were shipped in 1842 to 1846.[1] The following is the list given by Savitch:

Number of fur-seal skins shipped from the Commander Islands from 1847 to 1861, inclusive.

Year.	Bering Island.	Copper Island.	Total.
1847		903	903
1848	447	1,101	1,548
1849	554	1,377	1,931
1850	649	727	1,376
1851			
1852	1,453	1,819	3,272
1853	700	500	1,200
1854	854	500	1,354
1855		1,022	1,022
1856	1,749	1,028	2,777
1857	1,050	2,118	3,168
1858	1,000	2,446	3,446
1859	1,070	2,026	3,096
1860		2,088	2,088
1861			4,000
Total			31,181

ADMINISTRATION.

There remains to be said a few words concerning the Government administration of the Commander Islands.

Before the establishment of the Russian-American Company the islands were scarcely under any territorial jurisdiction, though in reality they were undoubtedly subject to the rule of the "commander" of Kamchatka, a naval officer residing in Petropaulski. With the advent of the Russian-American Company the direct control of these islands went out of the hands of the Russian Government, but it seems that the company took but slight interest in them until 1826, in which year they were incorporated into the Atkha District, with headquarters on Atkha Island. After the permanent location of a colony, a Russian "overseer" was stationed on Bering Island.

When, in 1868, the Russian-American Company's régime was at an end, the islands returned to the jurisdiction of the "ispravnik" in Petropaulski, while the remainder of the Atkha District became part of the United States by the cession of Alaska to the latter. Kamchatka being, since 1855, only a district of the so-called Coast Province (*Primorskaya Oblast*), the administration of the islands consequently rested with the governor at Khabarovka, subject to the authority of the governor-general of Eastern Siberia at Irkutsk.

Thus things remained until the growing importance of the seal business during the lease to Hutchinson, Kohl, Philippeus & Co. made it desirable to locate a higher official on the islands to represent the Government in its dealings with the company on the islands and to govern the natives. Mr. Nikolai Aleksandrovich Grebnitski was selected as the first "administrator," landing on Bering Island on August 21, 1877, and has continued as such up to the present time. His long retention in office, coupled with the fact that his salary has been raised repeatedly, that he has gradually risen in rank until he now holds that of a colonel, and that he has been decorated several times, is ample proof that he has conducted the affairs of the Commander Islands to the full satisfaction of his Government.

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[1] See p. 97 on the close season asked for the Commander Islands in 1842 and granted in 1843.

As subordinates, two kossaks from Kamchatka were stationed one on each island. Since 1890, however, another civil officer has been located on Copper Island, acting as Mr. Grebnitski's assistant there. Until last year, when he had to seek a milder climate on account of broken health, this position was held by Mr. Nikolai Matveyevich Tielmann. His successor was on his way to the islands in the fall of 1895 on the bark *Bering*, but on account of the weather failed to make a landing and had to return to Vladivostok.

One of the first things attempted by Mr. Grebnitski, after putting the community affairs of the natives into shape, was to regulate the fur-seal business, i. e., the administrative portion of it as it related to the taking of seals on the rookeries, and the rules first framed were embodied in an order (*prikaz*) dated April 28, 1878 (o. s.), and the second chapter of a regulation (*predpisanie*) of the following May 1 (o. s.).

In the latter a form was provided which, when filled out and signed by the overseer and native chief, is returned to the office of the administrator. Printed blanks are now furnished, and to illustrate this useful document a sample is herewith appended, as follows:

AKT.

Rookery at *Glinka, Copper Island.*
Killed in drive *June 6, 1881:*
1,053 pieces fur-seal bachelors.
2 females.
0 bulls.

Total..*1,055* pieces.
Not accepted by the company for the following reasons:
(1) tooth-marked .... *3* pieces.
(2) cut *0*
(3) undersized *2*

Total not accepted .... *5* pieces.
Of these, the 3 tooth-marked skins were returned to the natives, the 2 undersized ones were salted.
Accepted by the company, *1,050* pieces.
Overseer, Copper Island............ *Sergeant Selivanof* (signed).
Chief, Copper Island .... *Anastas Kadin* (signed).
The receipt given by the agent is appended as a separate inclosure.

The more recent form of this blank is somewhat enlarged and covers three pages. First page is essentially as the above, with the running number in the upper left-hand corner. The second page is intended for a "List of the sealers which have cut any skins." The third page provides for the following headings:

Time when drive commenced ....
Time of drive till arrival on killing grounds ....
On the road the following animals became overheated:
  Bulls.....................
  Females..................
  Bachelors ....
Resulted in ...... overheated skins, which were turned over to the natives for their own use.
The killing lasted ......

The following animals became overheated on the killing grounds:

Bulls....................

Females..................

Bachelors ....

Special happenings:

Gradually a set of elaborate regulations have been framed which govern the rookery business.[1] Such as differ from those in vogue on the Pribilof Islands are here quoted from Lieut. Commander Z. L. Tanner's report for 1892 (Rept. U. S. Fish Com., 1892, p. 40), as follows:

> None but natives are allowed to work on the rookeries.
>
> A fine of 100 golden rubles is imposed by the Government upon anyone who kills a female fur seal, and 10 rubles for killing a pup, and such additional fine shall be paid as shall be imposed by the natives themselves.
>
> No person, native or otherwise, is allowed to wear boots with nails in them on the rookeries; rubber boots or tarbasi[2] must be used.
>
> Chewing or smoking tobacco, expectorating, or attending to the requirements of nature are strictly prohibited on the rookeries.
>
> Knives may be carried, but a stick with a metal ferule is not permitted.
>
> No small boys or females are allowed on the rookeries, and dogs must be left half a mile from the rookeries during the breeding season.

Owing to the repeated raids on the rookeries, particularly those on Copper Island in the early eighties, by marauding schooners, which the natives in several cases had to drive off by means of powder and ball, an experiment was decided upon to station regular soldiers on the islands in order to protect them. In June, 1884, the Russian cruiser *Razboinik* brought one officer and twenty-three men for Copper Island and nine men for Bering Island. Five soldiers were stationed at the South Rookery of the latter island, where they did good service in driving off the schooner *Sakhalien* and capturing one of the crew. In a few years, however, the soldiers were withdrawn, and instead the watch force of the natives was organized in a military manner, one Kamchatkan cossack on each island and two conscript soldiers of the regulars, serving their time, acting as officers, under the immediate command of the administrator and his assistant. Watchhouses are erected overlooking the rookeries, and the guards provided with good spyglasses and rapid-firing army rifles. Stands of arms and plenty of ammunition are kept in the Government building at the settlements.

The central authorities maintain the supervision of the local administration by occasionally sending out an inspector, or "revisor," as he is called. His duty is to ascertain the state of affairs generally, as well as the condition of the natives, to receive any complaints of the latter, and investigate their grievances. The governor-general personally visited the Commander Islands in the spring of 1897.

A change has of late years been effected in the higher administration of the islands, inasmuch as they have been transferred from the Department of the Interior to the Department of Domains and Agriculture, without prejudice, however, to the territorial jurisdiction of the governor-general of the Amur Provinces. The administrative status of the Commander Islands is therefore now exactly parallel to that of the Pribilof Islands in their double relation to the United States Treasury and the governor of the Territory of Alaska.

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[1] These, embracing 15 articles, were issued collectively by Governor-General Baron von Korff (Priamurski) February 25, 1886.

[2] Native seal-skin moccasins.

CONDITION OF THE COMMANDER ISLANDS ROOKERIES.

PRELIMINARY REMARKS.

When, in 1882, Prof. S. F. Baird sent me to the Commander Islands to study their natural history he also impressed upon me the desirability of obtaining some information in regard to the fur seal and the sealing industry of the islands. Owing to my hurried departure—I had only 48 hours in which to prepare for the expedition destined to stay two years in the field—I failed to take a photographic outfit with me. In default of photographs, however, I made numerous sketches of the rookeries, and also undertook to construct maps of them by means of an azimuth compass and a pediometer. I submit some of the sketches with this report in exact facsimile of the originals; they have not been touched up in any manner (pls. 20, 41, 42, 43). For that reason they appear extremely crude, but it is thought that they will be accepted with more confidence in their present shape and carry with them more conviction than if they had been fixed up or "improved" in any way.

The only photographs of the rookeries in their palmy days were taken by the Russian Colonel Voloshinof, but with only a few exceptions they are not intended to portray the totality of seal life on the individual rookies, and for that reason offer but scant material for comparison with my sketches of 1882–83, or my photographs of 1895, the more so since the points of view in all instances except one are different from mine. However, those that can be utilized in this connection I have reproduced.

When photographing the rookeries last summer I made a special effort to obtain views from the identical points from which I had made my sketches in 1882 and 1883. Taking into account the different focus of the eye and the photographic lens, I think a comparison between the sketches and the photographs will establish the general accuracy and truthfulness of the former.

When studying the rookeries in 1882–83, I did it with H. W. Elliott's Monograph of the Pribilof group in my hands. In the main I found that his observations in regard to seal life were applicable to the Commander Islands seals, and at the same time that the conditions of the sealing industry were also nearly the same on the two groups, so far as could be judged from descriptions alone. There were minor points in which I found, or thought I found, differences, but in the main I agreed, with one notable exception, however, viz, the estimation of the number of seals on the rookeries. Of course, his estimate related only to the Pribilof group, and as I knew the latter only from his description, I felt bound not to criticise him. But I became sure of this: His methods and results did not apply to the Commander Islands. Elliott's method was to ascertain the area of the rookeries in square feet and then multiply this with an average figure calculated from the number of seals, large and small, counted on a certain piece of ground. But I found insurmountable obstacles. In the first place, the method required not only a very detailed and accurate topographical survey on a large scale of each rookery, but the calculation of the area presented an exceedingly difficult problem. No two pieces of ground are alike. In some the beach is smooth and the seals are lying close; others are covered with smaller or larger rocks and stones, where the seals lie scattered as a matter of necessity. In other places, again, there are open spaces or thin spaces. Then, again, the outlying rocks and reefs defy close calculation as to number and area. On Copper Island small herds of seals would be found in corners and coves, on ledges of cliffs, and under overhanging rocks, sometimes entirely out of sight and most times beyond computation. I found that every factor of the calculation would have to be estimated averages, and that these averages in their turn had to be founded upon estimated items; in short, that the whole calculation would have to be a product of guesses multiplied by guesses. As we have to deal with large figures, it is evident that a mistake in the estimated factors must result in disastrously great mistakes in the total number.

Suppose, for instance, that I had "estimated" the area covered by the seals on both islands to be 4,000,000 square feet. If I "estimated" the average ground covered by a seal (mother, pup, and bachelor) on the rookeries to be 2 square feet, I would obtain a total of 2,000,000 seals on the Commander Islands. But, on the other hand, if I guessed that on the average a seal, large and small, on the rookery occupies 5 square feet—and this would possibly have been more nearly correct—I would get only a total of 800,000 seals, large and small. According to this method, various persons might estimate the number of seals on north rookery, Bering Island, from 20,000 to 120,000, and yet it might be impossible to convince any of them that they were mistaken.

A numeration of the seals being utterly valueless unless accurate, or at least approximately accurate, I naturally regarded such an estimate of the number of seals on the rookeries not only as useless, but as downright pernicious. Actual counting being impracticable, and an individual judgment of the number being about as valueless as the above method of calculation, unless acquired by a very long practice, I gave up all attempts at presenting figures.

When, after twelve years, I again visited these rookeries the same question confronted me. In one place, where I had an unusually good opportunity, I tried to make an estimate of the average area occupied by a seal on that particular rookery. On July 16, watching the seals before me on Kishotchnoye rookery, Bering Island, I wrote in my notebook as follows:

> Here is a harem right in front of me, 1 sikatch, 16 matki, and about as many pups. They are lying as close together as about the average, and they easily cover a piece of ground 20 by 20 feet, 400 square feet, or more than 11 square feet per animal, pups and all. Ten square feet per animal for this rookery is, therefore, I think, a fair estimate.

But when I came back to the north rookery and tried to apply my estimate, I was entirely at sea. I could not make up my mind whether the seals on the average were lying as close as above, or closer. Of course, I could see places where they were thicker, and others where they were thinner, but I could not, to my own satisfaction, strike an average, if for no other reason, because there were great portions of the rookery of which I could get no general view. Under those circumstances I would have regarded it as the merest humbug to present any figures pretending that they meant anything. Consequently, I wasted no further time upon getting at the probable number of seals on the Commander Islands rookeries.

The only method which promises reliable results is the one adopted now on the Pribilof Islands by the experts of the United States Fish Commission, viz, to actually count the number of seals on several large tracts of rookery, each of the size of an acre or more. In this way an average per acre may be obtained, which, multiplied by the computed acreage of all the rookeries, will give an approximate number which may not be too far out of the way. But, unfortunately, this method is hardly applicable to the Commander Islands, for various reasons, chief of which is the impossibility of making an actual count over a sufficiently large area to insure a reliable average. The rookeries are so very different among themselves that it would be necessary to have a separate count of each of them.

COMPARISON BETWEEN THE CONDITION OF THE ROOKERIES IN 1882-83 AND 1895.

BERING ISLAND.

NORTH ROOKERY, 1882-83. (Plate 94.)

When I first visited the northern rookery, thirteen years ago, there were three distinct breeding areas, viz, the Reef and Sivutchi Kamen, counted as one; a smaller patch between Babin and the creek, and Kishotchnaya. The bachelors hauled out on many of the outlying rocks surrounding the reef, and also in the rear of it on the smooth, white parade-ground. A large patch of them occupied the space back of the breeding-ground at Babin, large numbers extending a considerable distance back on the grassy area later in the season. Between the creek and Kishotchnaya there were three patches of bachelors. The whole distance from Sivutchi Kamen to Blizhni Mys, therefore, was practically one continuous seal-ground. The breeding grounds at Kishotchnaya were surrounded by a heavy fringe of bachelors, who also sported in great numbers on the smooth, gravelly space in the rear of the rookery. South of Kishotchnaya, between the latter and Maroshnik, were again two separate patches of bachelors. In 1883 for the first time bachelors were known to haul out regularly throughout the season on the beach called Tizikof, beyond Maroshnik. They used to haul out there—and even as far south as Fontanka—late in the season, but their permanent settling on the beach in question was then regarded as an indisputable proof that the rookeries were increasing. It was at this last-mentioned point that the *Otome*, an English schooner, with a Japanese crew, made a raid during a dark night in August, 1883, and killed 300 to 400 seals. The mate was captured by the natives and the schooner the next morning by Mr. Grebnitski, on board the steamer *Aleksander II*.

The rookeries were in excellent condition, both as to quantity and quality. All classes of seals were well represented, and only skins of standard size were taken. This was particularly the case in 1883, when the company's representatives had very strict orders not to accept a single skin under 8 pounds. During that year 50 per cent more skins could easily have been taken, but for business reasons the company wished to reduce the catch as much as possible, and it was only after some strong pressure was brought upon Captain Sandman by Mr. Grebnitski that he agreed to take as many as he did.

It is a fact well worth mentioning that even in those days females and pups got unavoidably mixed up in the drives. The percentage was not very great, but great enough to be a distinct feature of the drives on this island. However, as the drive progressed they were pretty successfully weeded out, and comparatively few reached the killing grounds. Killable seals being plentiful, pods of females were allowed to escape along the route of the drive, even though they might include a few bachelors.

NORTH ROOKERY, 1895. (Plate 95.)

Upon inspecting the north rookery again last summer I found a great change in many respects. Before reaching the rookery itself the absence of fresh or decaying carcasses on the killing grounds was in marked contrast to the noisome sight and smell which used to form the first impression of the visitor arriving at the village. Nowadays every carcass is utilized. The choice parts of the meat are salted down in the many boxes and barrels dotting the ground in the rear of the killing grounds, while the rest, including the entrails, are put in holes in the ground for winter food for the sledge dogs.

On the rookery itself the first change which struck me was the fact that the entire beach between Babin and Kishotchnaya was depleted of seals—not a single breeding seal between Babin and the creek, nor a bachelor—all the way to Kishotchnaya. Later on I found that the hauling grounds south of the latter place were also deserted. Instead of the imposing series of breeding and hauling grounds from Sivutchi Kamen to Tizikof, I found only two patches of breeding grounds, now forming almost two distinct rookeries—the Reef and Kishotchnaya.

I was prepared for a diminution of the seals, and it caused me, consequently, no surprise. On the other hand, I was considerably surprised at finding (July 8–10 and July 15–20) the *breeding grounds* of the Reef outlined very much as I had seen them in 1883.[1] The bulk of the harems were located on the western side of the Reef, rounding the point of the "sands" and extending in a long, narrow horn south along the eastern edge of the latter. A narrow band obliquely across the "sands" formed a connection and separated off an oval bald spot of the white ground toward the northern extremity of the "sands." It is a noteworthy fact that this "bald spot" was an equally characteristic feature of the rookery in 1883 as in 1895. But what I did miss was another connecting band, viz, between the southeastern extremity of the breeding seals toward the one alluded to above. While thus the distribution on the whole was the same as formerly, there was a perceptible shrinkage in the width of the areas covered by the seals, and it seems to me also in the density of the seals, though of this I can not be so sure. The rookery is so much looked at from the side that it is very difficult to judge correctly of the space between the seals.

To show the changes from 1882 to 1895, I submit some illustrations and two maps, which need some words of explanation.[2]

The drawing submitted (pl. 20) is taken from a photograph of a pencil sketch made by me July 30, 1882. Mr. Grebnitski, in going to St. Petersburg in the autumn of 1882, was anxious to have it accompany his report, and upon his arrival at San Francisco had a photographic copy made, which he sent me, and which is here reproduced. Like most drawings, the vertical dimensions are exaggerated, but on the whole it gives a fairly accurate representation of the rookery. The inner edges of the breeding-grounds are obscured by an immense number of bachelors on the "parade" or "sands," but the sketch shows pretty conclusively that the salient features are yet maintained.

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[1] When I first saw the rookery on July 4 it had not quite filled out yet, and I thought the depletion very great indeed; there was then no sign of the oblique belt across the sands, and the seals at the southeast corner formed a small, isolated herd.

[2] Dr. Slunin in his recent report (Promysl. Bog. Kam. Sakh. Komand. Ostr.) has been singularly unfortunate in misunderstanding an old map by Mr. Grebnitski with regard to the extent of the rookeries on Bering Island. In the legend on plate 7 the dotted areas are represented as being the "rookeries according to Grebnitski." I have the original map, the so-called "Sandman-Grebnitski" map, before me, and can assert positively that Grebnitski never meant to represent the rookeries by the dotted areas, which are nothing else but the reef surrounding the island. Of course Grebnitski did not intend to convey the idea that more than 60 miles, or half the entire coast line of Bering Island were occupied by the rookeries.

The photograph by Voloshinof (pl. 27*a*), taken in 1885, unfortunately is not very clear, but there is enough in it to show that the breeding area, so far as it can be seen from the direction of the salt-house, has shrunk comparatively little. My photographs (pl. 21) were taken from practically the same standpoint as the sketch and Voloshinof's photograph, and they afford as good a comparison as can be expected from photographs taken at such a distance. Those taken from a somewhat different standpoint, viz, from the driveway (pl. 22), give perhaps a better idea of the rookery, small as they are.

The map representing the seal grounds in 1883 (pl. 94) was sketched on August 21, and shows the distribution of the seals on that date—hence the lack of definiteness to the areas of red and the extension of the bachelor seals into the grass-covered area. The map showing the location of the seals in 1895 (pl. 95), however, represents the seals as they were located July 17 and 19.

At *Kishotchnaya* I found the same state of affairs as on the Reef, only that the patch had shrunk still more and the seals apparently covered the ground less densely than on the Reef. This last observation, however, is not to be relied upon, as the breeding ground can be looked down upon from a much greater elevation (70 feet), though at a greater distance. Bachelor seals in small numbers hauled out on the outer rocks and in among the females in the rear of the rookery, but the center of the "parade" ground was deserted all summer, and never a seal entered the posterior third of the latter, now covered with a scanty growth of tufted grass.

It was at once apparent that there was a low percentage of *bulls* on both rookeries, though at the Reef I afterwards found that the condition was not quite so bad as I first was led to believe. Upon my third visit to the rookery, when the wind was favorable for approaching it from the west side, I discovered that there were a good many more bulls proportionately to the females on that side than on the eastern half, which is the one first reached and most commonly seen. The formation of the ground made it utterly impossible to make a reliable estimate of the average number of females to each bull by counting a sufficient number of harems. At Kishotchnaya, however, the opportunities were more favorable, and on July 16 I averaged at the south end of that rookery about 50 females to a bull, while at the northern end the harems appeared smaller, most of those counted containing 15 to 25 females. A great many females were in the water that day, however; so in all probability the whole rookery averaged no less than 40 females to the bull. This proportion did not seem to be the result of or to have caused any lack of vigor in the males, for there was quite a number of large *half-bulls* skirting the rookery or hauled out on the outlying rocks, looking longingly toward the breeding grounds.

The greater falling off in this rookery was due to the decrease in the number of *bachelors*. But instead of affecting all classes this diminution was chiefly confined to the younger ones. Last summer all the skins were weighed individually on a spring balance as the killing went on, and an accurate tally kept. I submit below a table of weights of the skins taken in 13 drives between July 14 and September 13, 1895. From this it will be seen that no single skin under 7 pounds was taken, and of this weight only 235 skins; that in 4 drives not a skin under 8 pounds occurred; that in none of the drives was the average weight less than 9.7 pounds; that of 6,725 skins, 5,558 weighed 9 pounds and over; and that the average weight of these 6,725 skins was 10.3 pounds. This table is also very interesting, showing how uniform was the size of the animals driven during the whole period of two months. Its true significance, however, can only be appreciated when it is remembered that the rookeries were scraped absolutely clean, and that not a seal was allowed to escape that would have yielded an acceptable skin. It can be stated with almost absolute certainty that there was not a bachelor seal on north rookery, Bering Island, of the class yielding 6-pound skins.

Weight of skins taken in 13 drives on north rookery, Bering Island, 1895.

Date.	7 lbs.	8 lbs.	9 lbs.	10 lbs.	11 lbs.	12 lbs.	13 lbs.	14 lbs.	15 lbs.	Total.	Average.
1895.										*No.*	*Pounds.*
July 14	5	90	74	61	48	53	11	4	2	343	9.8
19	4	70	90	237	75	60	8	1	0	545	10
29	0	53	110	138	211	161	50	10	0	733	10.7
Aug. 2	0	42	54	140	150	140	90	0	0	616	10.9
4	9	35	40	27	31	50	20	5	0	217	10.3
6	0	56	107	194	241	114	103	60	0	875	10.9
8	0	10	30	60	48	11	20	10	0	189	10.6
12	25	100	100	80	90	36	40	61	0	532	10.3
22	4	85	139	215	203	179	28	52	0	905	10.6
24	15	40	35	28	46	38	14	16	0	232	10.4
31	104	211	171	62	103	120	100	9	0	880	9.7
Sept. 10	50	93	80	66	85	40	35	10	0	459	9.8
13	19	47	34	20	29	16	17	12	0	194	9.8
Total	235	932	1,064	1,328	1,360	1,018	536	250	2	6,725	10.3

Though not literally absent, the *yearlings* were practically so. From the next table, which shows the number of each class of seals contained in the same 13 drives, it will be seen that out of 29,112 seals driven to the killing grounds only 540 were yearlings, or 1.86 per cent. It was a constant source of wonder on Bering Island, in 1895, what had become of the yearlings. From time to time it was confidently predicted that they would turn up "later," but they did not come at all. There was a slight proportionate increase after the middle of August, but too trifling to amount to anything. And again I must emphasize the fact that the rookery was scraped clean in search of seals. This fact is startlingly disclosed by the following table, and because of its great importance it requires a full explanation:

Details of 13 drives on north rookery, Bering Island, 1895, showing sex and age of seals driven.

Date.	Killed.	Escaping.				Total driven.	Remarks.
		Females.	Yearlings.	Pups.	Bulls.		
1895.							
July 14	348	1,305	0	13	11	1,677	
19	545	1,090	11	69	9	1,724	
29	733	1,738	23	35	13	2,542	
Aug. 2	616	1,436	14	67	8	2,141	
4	217	779	9	35	7	1,047	
6	875	2,014	5	159	11	3,064	
8	189	1,134	5	68	4	1,395	
12	532	2,077	74	104	5	2,792	
22	905	2,928	173	295	8	4,309	
24	232	1,265	56	51	4	1,608	
31	880	2,259	55	108	5	3,307	
Sept. 10	459	1,718	38	69	8	2,292	14 stagy.
13	194	825	77	115	3	1,214	51 stagy.
Total	6,725	20,568	540	1,183	96	29,112	
Percentage of total driven	23.10	70.65	1.86	4.06	0.33	100.00	

Upon my arrival, in 1895, I impressed upon Mr. Grebnitski the desirability of having such a census prepared, and suggested that Selivanof, the kossak in charge of the rookery, be ordered to undertake the work. Mr. Grebnitski, fully aware of the great importance of knowing exactly what classes were represented in each drive, at once took up the suggestion and ordered Selivanof to make a detailed tally of each drive according to the scheme I furnished. The drive on July 19 I counted myself conjointly with Selivanof, and the tally sheet is here produced to show how the work was done and how much reliability can be placed upon it. The seals killed and those escaping from each pod, as it was culled and slaughtered, were separately counted, Feoktist Ivanof Korsakovski counting the dead ones, Selivanof and I those allowed to escape.

Tally of drive taken July 19, 1895, north rookery, Bering Island.

Pod No.	Killed.	Escaping.				Pod No.	Killed.	Escaping.			
		Females.	Yearlings.	Pups.	Bulls.			Females.	Yearlings.	Pups.	Bulls.
1	8	15	2	......	......	22	20	21	1	4	......
2	9	35	......	......	......	23	10	30	1	1	......
3	7	38	......	1	......	24	26	10	1	2	......
4	13	28	......	......	......	25	11	21	......	......	......
5	16	34	1	2	......	26	12	19	......	......	1
6	11	32	......	......	......	27	18	23	......	2	2
7	18	22	......	......	......	28	23	16	......	9	......
8	11	28	1	......	......	29	28	43	......	6	......
9	7	23	......	2	......	30	12	35	......	3	......
10	9	25	1	......	......	31	22	42	......	1	......
11	12	9	1	4	......	32	20	51	......	9	......
12	11	26	......	......	......	33	11	12	......	......	......
13	6	20	......	......	......	34	7	21	......	1	......
14	9	26	......	1	......	35	15	40	......	6	1
15	21	28	......	4	......	36	12	25	......	2	......
16	3	34	......	......	......	37	10	23	......	2	......
17	16	31	......	1	1	38	11	35	......	2	......
18	9	28	......	......	......	39	30	51	......	1	2
19	13	35	......	......	2						
20	20	27	2	3	......	Total	538	1,090	11	69	9
21	11	28	......	......	......						

The accuracy of the above tally is attested by the fact that the number of skins taken in this drive was 545. Sometimes the killed ones of the previous pod were lying so close to those being counted that it was difficult to ascertain the exact number, in which case the smaller figure was noted. And so with the escaping ones. Selivanof and I counted separately; if we differed, and a recount was not practicable, we took the lowest figure. The percentages are, therefore, very nearly correct. If there is any error, it is in understating the number of females, but I am sure that the possible error does not exceed 1 per cent.

The figures of the 13 drives in the table previously given were ascertained in the same manner, and I have no doubt that they are essentially correct. No tally was kept previous to the drive on July 14, and I failed to obtain the details of the drive on July 24, but there is no reason to believe that the percentage of the classes was different in these drives, except that I was informed that there were no females or pups in the first drive, June 13. In order to complete the record of this rookery for 1895, I submit the following table of the skins taken in each drive during the summer season:

Total number of skins taken on north rookery, Bering Island, during the summer season of 1895

Date of drive.	Skins.	Date of drive.	Skins.
June 13	110	Aug. 8	189
25	187	12	532
July 6	262	22	905
14	348	24	232
19	545	31	880
24	1,057	Sept. 10	459
29	733	13	194
Aug. 2	616		
4	217	Total	8,841
6	875		

It may be interesting in this connection to present a corresponding table for the same previous years to show the dates and size of the drives. The following ones are taken from Venning's report (pp. 15–18):

Number of skins taken on north rookery, Bering Island, during the summer season of 1891.

Date of drive.	Skins.	Date of drive.	Skins.
May 29	51	Aug. 8	1,642
June 9	300	19	1,842
19	606	25	1,060
27	445	29	1,550
July 9	456	31	1,218
15	774	Sept. 1	469
23	1,233	4c	32
25	796		
Aug. 2	678	Total	13,152

Number of skins taken on north rookery, Bering Island, during a part of the summer season of 1892.

Date of drive.	Skins.	Date of drive.	Skins.
June 1	9	July 29	1,543
22	766	Aug. 5	1,288
27	568	7	1,127
July 2	313	11	1,487
6	296	12	846
14	903	16	980
18	1,325	20	1,132
22	911		
24	1,072	Total[a]	14,566

[a] This table is incomplete, as the total number of skins taken on this rookery in 1892 was over 16,000. The 1,500 additional seals were probably killed after August 20.

Number of skins taken on north rookery, Bering Island, during the summer season of 1893.

Date of drive.	Skins.	Date of drive.	Skins.
May 28	[a] 3	July 31	1,159
June 24	826	Aug. 5	1,392
July 2	568	7	852
13	472	10	400
18	1,370	13	1,932
23	1,670		
27	1,516	Total	12,160

[a] For food.

Looking again at the table of the classes in the 13 drives, we note that it was necessary to drive off over 29,000 seals in order to obtain 6,725 skins, and that of those 29,000 no less than 20,568 were females. As already stated, there is no reason to suppose that the percentage of females differed materially in the other 4 drives, except one. If, therefore, we calculate the corresponding figures for a total of 8,231 (8,341—110) skins, we find that in order to obtain 8,341 skins, the total catch for the season, it was necessary to drive off to the killing grounds 35,741 seals of all ages, of which *the astounding number of 25,174 were females.* In this count are not included such females as were allowed to escape along the road of the drive, although the number of females thus culled was comparatively few, as the men were afraid of letting a single killable bachelor escape.

Nothing could better illustrate the straits to which this rookery has come. On the other hand, nothing could better demonstrate how little the driving disturbs the seals. Here is a rookery where the females have been driven probably as long as seals have been taken, though not in the same proportion as now. Yet the females return to be driven over and over again, and the *breeding ground* is the part of the rookery least affected in the general decrease.

A great amount of mortality due to starvation was observed among the pups, but is here only alluded to, as I have treated of that question in another connection (p. 78).

SOUTH ROOKERY, 1882. (Plate 95.)

This rookery, although probably the remnant of the innumerable multitudes which Steller speaks of, has not been of much account of recent years. After the interregnum, 1869–1871, it was so insignificant that no regular catch seems to have been made until 1880, although occasionally, i. e., before and after the season closed on North Rookery, a few seals were killed at Poludionnoye in order to get fresh meat for the main village, Nikolski. Thus, in 1878, 50 were killed in June and 30 on November 5.

The result was that the rookery was gradually increasing. Finally, in 1880, it was deemed sufficiently large to station a small force of men under Mr. Volokitin at the place, and in that year 787 skins were taken. It seems, however, that the capacity of the rookery was underestimated and not enough salt was landed, so that no more could be taken care of. In 1881, in spite of the complaint that although there are "many sikatchi on both rookeries" there are "but few holustiaki, mostly in the water," the South Rookery yielded 1,150 skins. The following year (1882) the catch was 1,410.

When I visited this rookery on August 21, 1882, I found the entire beach between the first and second cape west of the waterfall covered with seals, the breeding seals occupying the portion nearest to the water, the bachelors patches at both ends and in the rear up to the inner grass-covered belt.

SOUTH ROOKERY, 1895. (Plate 96.)

How different when I approached the same ground again August 17, 1895, thirteen years later almost to the date! Only a handful of female seals were left at the extreme western end of the rookery.

I am very fortunate in being able to present copies of two photographs taken by the late Colonel Voloshinof in 1885, which, as they are taken from almost the same standpoint as one of my own (pl. 29), afford excellent comparison between the conditions of Poludionnoye rookery then and now. In the right-side half of his double picture (pl. 31*a*) a series of smaller rocks in the water extends from the beach to the outer end of the west reef. This series of rocks will be recognized toward the lower left-hand corner in my photograph (pl. 29), and will serve to orient the reader. It will then be seen that the entire beach, which in my picture of 1895 is absolutely bare of seals, is covered with thousands in Voloshinof's picture of 1885, and that the compact body of seals then extended even a good distance beyond. To complete the comparison I add another photograph of mine (pl. 28) looking in the opposite direction (toward the waterfall), which shows the utter desolation of the entire beach beyond the little black patch.[1]

As for the proportions of the various classes of seals on this rookery, I found the conditions to be similar to those on the north rookery. It was reported in Nikolski that there had been only 1 bull on the rookery in 1895, but upon inquiry at the rookery I was informed by Nikanor Grigorief, the native in charge, that the actual number of sikatchi had been 5. This number may be considered exact, and the number of females to each bull was, therefore, probably nearly 100. There were plenty of pups when I visited the rookery, and no barrenness of the females was suggested.

By dint of hard scraping no less than 564 skins were secured in 1895, 159 of them, however, between August 17 and September 9.

COPPER ISLAND.

KARABELNOYE ROOKERY, 1882-83. (Plate 99).

The distribution of seals on this rookery, as I found it during the week July 3-10, 1883, is shown on the map (pl. 99). Every available space under the cliffs was occupied by breeding females. Even the ledges at the foot of them and the lower portion of the steep ravines were full of them. The bachelors were obliged to be satisfied with the outlying reefs and rocks, with the beach on the east side of Karabelni Stolp, and the rocky beaches at Vodopad and beyond. The rookery was in excellent condition, all classes of seals being well represented. In fact, there was unquestionable proof that the rookery was increasing.

Curiously enough this fact was brought home to the natives located at Karabelni by the circumstance that they were unable to obtain in good season the number of skins required from this rookery. When I arrived at Karabelni in the beginning of July the natives were deeply concerned because of their failure to obtain the last 1,000 skins. As the families are paid for each skin brought to the salt house, this meant a serious loss to those stationed at this point. They finally decided to go to Glinka, where the season was already over, and there got all the skins they wanted. In answer to my inquiry as to the cause of their failure to obtain the skins at Karabelni I was told that it was because the rookery was increasing. Self contradictory as this statement appeared, it was nevertheless easily explained. The main hauling ground of the bachelors, i. e., the one yielding most skins and from which the seals could be driven, was the Karabelni Stolp. Looking at the map (pl. 99) it will be seen that at the base of the neck there was a large breeding ground. The breeding seals were increasing here to such an extent as to occupy the whole space along the beach, actually shutting off the hauling ground, thus making it impossible to drive any seals from that place. The men were therefore obliged to take the skins at Vodopad and Krepkaya Pad, which meant that they had to carry every skin on their backs across the island. When it is considered that the population, even under ordinary circumstances, was rather insufficient for the work, it may easily be understood what a hardship this increase of the rookery involved. But not only the breeding seals were increasing, the bachelors were also extending their territory. The result was that skins were taken in Malinka Bukhta for the first time. At this place the women did the skinning and carrying, for even here the skins had to be carried, while the men were engaged at Krepkaya Pad.

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[1] Pl. 67, taken in 1897, affords even a better opportunity for comparison with Voloshinof's 1885 picture, since it was taken from the identical standpoint.

In addition to the map I have submitted three original field sketches of the rookery as I found it on July 3, 1883 (pls. 41-43). While making no claim for artistic merit I do claim for them sufficient accuracy for an intelligent comparison with my photographs of 1895, which were taken from the identical standpoints. The sketches have not been touched since I left the rookery in 1883 and are here reproduced in facsimile so as to eliminate the possibility of even unintentional alterations.

KARABELNOYE ROOKERY, 1895. (Plate 100.)

On July 31, 1895, Mr. Grebnitski and I landed in Stolbovaya Bukhta and pitched our tent on the beach just west of the killing ground. It was very foggy and the water high, so that we could not pass the point into Martishina Bukhta. Next morning, at 4.30 a. m., the fog still prevailed, but the water was low and we made our way along the beach to the rookery. We passed on to the Stolp without meeting a seal, where in 1883 thousands of breeding seals blocked the way of the drives. Only a small solid patch, leaning on the south base of the cliff, remained, an isolated outpost at this end of the rookery. At the Stolp itself we found a couple of small harems only at the northern end, and toward the southern extremity a small patch [illegible] bachelors, hardly more than a dozen. In the distance I could discern throug [illegible] fog faint outlines only of the breeding grounds.

After breakfast the fog lifted and I ascended the bluffs, which rise 300 feet above the breeding grounds. The photographs which are herewith appended (pls. 38–40) were taken from the various stations at the edge of these bluffs, marked on the maps, care being taken to select the same points from which I had made my sketches twelve years previously.

I found that while on the whole the breeding grounds had retained their former shape—necessarily, because of the natural conditions of the beach—there was a great thinning out of the ranks of the *females*. At the same time a large area at the northwestern end had become nearly depopulated. At first I credited the thinness of the breeding herds to the bright weather, but another visit to the heights the next morning showed no improvement.

That day I saw no *bachelors*, except the little patch at the Stolp; none at Vodopad and Krepkaya Pad. At Malinka Bukhta, I was informed, they had ceased to haul up several years ago. The next day we saw a few more bachelors, a somewhat larger patch—at the Stolp, and two other patches, of possibly a hundred seals each, one on each side of the Vodopadski Nepropusk.

But one feature that struck me with surprise was the great number of *bulls* and *half-bulls*. This abundance of old males was particularly interesting, coming, as I did, directly from Bering Island, where this element was so scarce.

Pups were present in good proportion.

The decrease in the yield of this rookery has been considerable. While as far back as 1881 6,500 skins were secured without trouble, it was impossible for the men, in 1895, try as hard as they might, to secure more than 2,000. They were given full swing and encouraged to take as many as possible, though they needed no special encouragement, for the decrease in skins meant a corresponding decrease in food and comfort during the following winter. Moreover, the season was extended to the first week of September, and yet with no better results. Between August 12 and September 10 they could scrape together only 188 skins.

In order to give an idea of the dates and sizes of the drives on this rookery, I give the following table, extracted from Mr. Venning's report (p. 16):

Number of skins taken on Karabelnoye rookery, Copper Island, during the summer season of 1893.

Date of drive.	Skins.	Date of drive.	Skins.
June 11	623	July 26	146
15	872	27	116
20	398	27	110
July 2	778	31	236
7	265		
10	777	Total	5,345
18	1,024		

GLINKA ROOKERIES, 1882-83. (Plate 101.)

The capacity of Glinka used to be more than double that of Karabelni, having in good years yielded over 20,000 skins. The best hauling grounds were Palata, Zapadni, and Pestshanaya, but bachelors then hauled out as far as Babinskaya Bukhta in the south and Gorelaya Bukhta in the north. These distant grounds were only drawn upon occasionally, and the grounds between Urili Kamen and Palata Mys furnished the bulk of the skins. Of these Pestshani hauling ground was the most prolific and the handiest, although the driving was very severe before the new salt house was built, and single drives yielding more than 4,000 skins from this place were no exceptions.[1]

The principal breeding grounds occupied the inaccessible beach between the Stolbi in Gavarushkaya Bukhta to Palata Mys, comprising Sikatchinskaya and Zapalata, the gully and basin north of Palata, and, finally, the family grounds designated as Zapadni or Zapadni Mys. Palata, to the looker-on coming over the mountains, was probably the most impressive rookery view in the whole Commander Islands group. The solid blackening masses of breeding seals, filling the gully to overflowing and extending under the bluffs and along the beach on both sides, was a sight never to be forgotten. My original sketch, made in 1883 from a prominent point 800 feet above, is appended herewith as plate 52, in order to show the conditions as I found them then. It makes no pretensions at artistic merit, but it is faithful and true.[2]

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[1] Dr. Slunin reports that in 1887 a drive yielding 6,000 took place from this hauling ground.

[2] In the first edition of this report a later elaboration of this sketch had to be substituted, as the original had been mislaid. The latter, having come to light since, is therefore now reproduced as being more authentic.

Zapalata and Sikatchinskaya were the mainstay of the rookery, however. There the breeding seals were absolutely safe against all possible interruptions from the land side, while the bays themselves are wonderfully sheltered by reefs and outlying rocks, thus affording admirable places of safety for the growing pups, features which will be fully appreciated by an inspection of plates 55 and 56.

To illustrate the condition of these rookeries during the palmy days of the business I am fortunate enough to be able to copy a couple of Voloshinof's photographs (pls. 53 and 57*a*) made in 1885, to which I shall refer more in detail later on.[1]

GLINKA ROOKERIES, 1895. (Plate 102.)

On the 2d of August I approached the Glinka rookeries in a boat from the north and proceeded along their entire front from Lebiazhi Mys to Babinskaya Bukhta, where we camped. I saw breeding seals in most of the places where I formerly saw them, but in vastly reduced numbers. *Bachelors* were also seen, but they were few and far between. At Pestshani hauling ground, the place which once supplied many thousands, and which even as late as 1893 furnished 3,137 skins, there was not a single bachelor. True, a drive had been made from that place only a few days earlier, which had resulted in 700 skins, but these 700 skins were all that this famous hauling ground yielded in 1895.

However, the location of nearly all the former hauling grounds was marked, not so much by little bunches of a dozen bachelors or so, but, curiously enough, by a line of black *half-bulls*. They had hauled up and occupied the beaches with regular intervals, much as do the old bulls in spring before the arrival of the females; in fact, they were in a measure playing sikatch! These lonesome, patiently waiting polusikatchi were first seen at the old hauling grounds on both sides of Lebiazhi Mys, and then on the west side of Peresheyek and of Pestshani Mys, and finally at the eastern end of Babinskaya Bukhta. At these places they had hauled out by themselves. But, in addition, hundreds of these nearly mature young bulls (or sexually nature, though not strong enough to fight the older ones) skirted the breeding grounds, hauling out on outlying rocks and paying attention to the females coming out for a swim or a trip to the distant feeding grounds. On the breeding grounds dark-haired, vigorous-looking bulls abounded.

This superabundance of vigorous, mature males was a strongly marked feature of the rookery. This is the more remarkable if we remember that it was already late in the season when I visited Glinka and that, although I stayed until August 11, I saw no diminution of it. The natives also informed me that on account of the still greater number of bulls earlier in the season the fighting had been violent and incessant on the rookeries. This abundance of bulls I have been told has been noticed for several years.

In strong contrast to this exuberance of virility was the thinness of the *female* ranks. They spread over nearly the same territory as formerly, but the lines had shrunk and in many places there were large bare gaps. The magnificent Palata showed many of the characteristic features that I knew so well, and yet it was only the shadow of the old rookery. The line running backward up the gully was there, but it was very thin and narrow and broken in places. A comparison of my old sketch (pl. 52), taken at high water, with my recent photograph from the identical standpoint, low water (pl. 51), will give some idea of the difference I saw. Although taken from a point somewhat different from mine, Colonel Voloshinof's photograph of Palata as it looked in 1885 (pl. 53*a*) fully bears out my sketch, when it is remembered that he was standing several hundred feet lower to the right and that consequently the solid belt of seals at the base of Palata must look so much narrower on his picture than on mine. My other photographs (pls. 48, 49), looking toward Palata and Sabatcha Dira from the outlying rocks off the former, serve to more fully illustrate the disconnected and thin character of the breeding grounds in 1895.

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[1] In 1897, having Voloshinof's picture with me, I was able to locate its standpoint exactly and duplicate his exposure of 1885. The result is pl. 72. Where his photograph shows teeming masses of seals sporting on the barren clay, mine shows these clayey hills overgrown with grass and no seals.

And as with Palata, so with Zapalata. The change was less striking, though by no means less radical. On the contrary, Zapalata, in proportion, was even more deserted. It is a source of great satisfaction to me that in photographing this rookery I happened to place my camera on the exact spot where Colonel Voloshinof ten years previously had exposed a plate, and although it evidently met with some mishap, so that this picture is one of the less satisfactory ones, I have reproduced the two (pls. 56 and 57*a*). On the whole light beach my photograph shows nothing but stones, while the same area in Voloshinof's is teeming with thousands of breeding seals. By turning my camera in the opposite direction, I obtained the other picture (pl. 55), showing the same depleted condition.

To complete the series of photographs illustrating the condition of the various parts of the rookery, I finally reproduced one by Mr. Grebnitski, taken from the rocks in Sikatchinskaya Bukhta August 3, as I had no opportunity to photograph it myself. It tells the same story (57*b*).

The total number of skins shipped from Glinka in 1895 was 4,809 (including a few hundreds of the autumn catch of 1894), a trifle more than one-half the catch of the previous year.

In view of the great number of half-bulls and bulls it is interesting to note that the skins both from Karabelni and from Glinka were unusually small. No regular tally of the weight of the entire catch was kept on Copper Island, but upon our arrival there was a great complaint of the lightness of the skins. During my stay at Glinka, from August 2 to 11, the natives were unable to take more than one small drive, in spite of their anxiety to make more money and to obtain more fresh meat. The skins of this drive were weighed according to Mr. Grebnitski's directions, who himself kept tally. The weight of the skins was noted to the half pound, but to simplify the list and make it easily comparable with the corresponding ones upon Bering Island I only recorded whole pounds; a skin weighing 7½ pounds, for instance, I counted as 8 pounds, while 7¼ pounds was recorded as 7. Mr. Grebnitski's tally and my tally will differ to that extent, but the average will undoubtedly be very nearly the same. This average, it will be seen, is scarcely 7⅔ pounds. When I visited Copper Island in 1883 the company refused every skin under 8 pounds.

Weight of skins brought to the salt house at Glinka, Copper Island, August 8, 1895.

Weight.	Number.
Under 6¼ pounds (4½ to 6¼)	35
7 pounds	108
8 pounds	40
9 pounds	17
10 pounds	11
11 pounds	6
12 pounds	5
13 pounds	2
14 pounds	3
15 pounds	1
Total number of skins	228
Average weight of skins ... pounds	7.6

I may supplement this account of the Glinka rookeries by adding a table derived from Venning's report (pp. 15-16), which shows the dates and sizes of the drives during 1893.

Number of skins taken on Glinka rookeries, Copper Island, during the summer of 1893.

Date of drive.	Skins.	Date of drive.	Skins.
May 22	58	July 24	54
June 5	100	26	876
21	714	28	420
26	250	Aug. 3	194
26	570	4	273
July 1	782	8	213
4	1,215	11	566
9	524	12	304
14	300	13	452
14	624	14	742
17	890		
17	242	Total	10,900
22	537		

COMPARATIVE CONDITION OF THE BERING ISLAND AND COPPER ISLAND ROOKERIES, 1895.

In what little there has been said and written about the seal industry on the Commander Islands it has always been assumed that the conditions, aside from the difference in the physical aspect of the rookeries, were the same on both islands constituting the group. And this was actually the case not very long ago, at least in 1882-83, and, so far as I could ascertain, up to 1890. In that year, it is said, the bachelors were becoming somewhat scarce on Copper Island and some active work had to be done in order to secure the desired quantity, but inasmuch as this quantity appears to have been the largest ever shipped from Copper Island, the falling off can not have been excessive, though it may have been apparent on the hauling grounds.

In 1892, however, the decrease in the number of females on Copper Island became serious enough to cause public comment, while on Bering Island difficulty was experienced in obtaining the requisite, though not limited, number of bachelors.

Whatever the cause of the recent disturbance of the equilibrium of the rookeries on the Commander Islands, each island has been affected differently, and the conditions to-day of the rookeries on Copper Island differ radically from those of Bering Island. It may be useful to compare them point for point.

In Bering Island the number of females in proportion to the mature males is very much greater than on Copper Island. This results in an apparent deficiency in bulls on Bering Island and a corresponding superabundance of them on Copper Island.

In Bering Island the killable males are of great size, as proven by the weight of the skins, which in 1895 averaged over 10 pounds. The greatest deficiency was consequently in the younger seals, while yearlings were almost entirely absent. The proportion between the ages of the killables was quite reversed on Copper Island, where a lack of the older bachelors was seriously felt, while the great bulk of the skins taken were from the younger classes, the skins averaging probably less than 8 pounds.

As for the pups, it may be stated that they were abundant in proportion to the females on both islands, and no difference could be discovered in that respect. On Bering Island I found a considerable mortality due to starvation among the pups. On Copper Island no such thing was observed, but this negative result must not be taken as a proof or even an indication that no such mortality took place. It must be remembered that most of the breeding-grounds on Copper Island are inaccessible, and that it is almost an impossibility to distinguish the dead bodies of the pups from such a distance as it is necessary to watch them on Copper Island.

It was by the merest accident that I myself discovered the sad state of affairs on Bering Island, for if I had not gone over the rookery after the wholesale drive of the breeding-ground I should have remained in ignorance of the fact. The natives themselves were either concealing it, out of fear that they would be blamed, or, more likely, they were ignorant of the extent of the calamity. After the season is over the natives keep aloof from the rookeries, as they are strictly enjoined from disturbing the breeding-grounds without necessity. The simple fact, therefore, that I can report no unusual mortality on the Glinka or Karabelni rookeries proves nothing one way or the other.

CONDITION OF THE FUR-SEAL ROOKERIES IN 1896.

COMMANDER ISLANDS.

The following report upon my tour of inspection of the Commander Islands fur-seal rookeries has taken the form of a narration of the trip, being in fact mostly a transcript of the daily notes made.

The *Albatross* left Dutch Harbor, Unalaska, July 28, in the evening, and came to anchor off Preobrazhenskoye village, Copper Island, about 6.30 p. m., July 30. Being informed by Mr. N. S. Wachsmuth, the new assistant administrator in charge of the island, that Mr. Grebnitski, who alone could give permission to inspect and photograph the rookeries, was at the time at Nikolski, Bering Island, we proceeded to the latter place at 10 p. m., after having made a call ashore.

Mr. Nikolai Sergeivich Wachsmuth, formerly an army officer, but now in the civil service of his Government, is a young man and seems to have taken hold of his position with energy and enthusiasm. To this is unquestionably due the increased number of bachelors taken this year thus far on Copper Island, as compared with 1895, for the rookeries have been scanned much closer and scraped much cleaner than during any previous year. Means for taking seals at places where the natives never dreamed of killing bachelors, such as boats and ropes, have been devised, and Mr. Wachsmuth himself would get up the first man in the morning and call the men together for the drives.

The *Albatross* arrived off Nikolski the next day about 1 o'clock p. m., and Mr. Grebnitski came at once on board, extending a cordial welcome to us, and gave without reserve the fullest permission to inspect and photograph the rookeries. He even intimated that he might accompany us, and arrangements were consequently made for an early start next morning for South Rookery, where the landing was presumed to be good.

We were informed that Mr. Barrett-Hamilton, the British agent, had arrived on July 19 on board H. B. M. S. *Spartan* and that he was at present on North Rookery.

The news as to the condition of the sealing business was not encouraging. Bulls are still scarce, bachelors even more so, as up to July 25 only 2,354 skins had been taken. Nor are the skins quite as heavy as last year, the average weight being about 9 pounds; comparatively few 7 pounds, and yearlings nearly as scarce as last year. Females and pups, according to the tables, are driven as much or more than ever.

SOUTH ROOKERY, BERING ISLAND.

Press of official business preventing Mr. Grebnitski from accompanying us the next morning, August 1, we steamed away to south rookery, but on account of the fog did not get there until 2 o'clock p. m.

Making a landing in the flatboat, accompanied by two sailors, I was received by Laurenti Ivanof, the new starshena of the place, who informed me that up to date only 223 skins had been taken, and that the number of old bulls on the rookery had not exceeded six.

Proceeding at once to photographic station No. 1, duplicated last year's exposure (pl. 11).

The day was warm,[1] consequently nearly all the females were in the water, a large bunch of them sleeping and playing a little distance off the rookery, while quite a number of pups were also amusing themselves in the shallow water between the rocks. Quite a number were sitting on the latter and only a small proportion on the beach itself. A single bull was seen lying on one of the inner rocks; no bachelors could be distinguished.

The seals were this year lying farther east than last year, as shown on the map. I mounted the published map of last year (Russ. Fur-seal Isls., pl. 10) on the plane table and placed the latter on the bluff just back of the rookery at the point designated on the map accompanying this report (pl. 103) as station 4, the point being located by cuts from various points. As it was extreme low water, the reefs extended farther and more rocks were out of the water, features which have been added on the new map. The location of the seals was also fixed by cuts. The map, although only a hasty sketch, proved quite satisfactory.

I also duplicated my photograph of last year from station 3 (pl. 10).

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[1] The thermometer on board the *Albatross* registered as follows:

3 p. m., air, +54° F.; water, +48° F.
4 p. m., air, +56° F.; water, +48° F.
5 p. m., air, +55° F.; water, +54° F.

A count of the pups was attempted, which gave about 328 pups on the rocks and on the beach, while probably at least a hundred more were sporting in the water. In all there were probably fully 450 pups, which leads me to the conclusion that the condition of this breeding ground is not much worse than last year (1895), and also that the five old bulls of last year, with at least 100 females each, did their duty nobly. It would thus seem as if the conclusions which I was drawing last year and which I proposed might be tested on south rookery during the present season were sound. (See my Russ. Fur-seal Isls., p. 64.)

Returned to the vessel about 5.30 p. m., and the *Albatross* was soon on her way to Copper Island.

Table of fur seals killed at south rookery, Bering Island, 1896.

No. of drive.	Date. (new style.)	Bachelors killed.	No. of drive.	Date (new style).	Bachelors killed.
1	July 2	7	11	Aug. 14	44
2	July 7	15	12	Aug. 19	38
3	July 12	26	13	Aug. 23	27
4	July 17	34	14	Aug. 27	21
5	July 23	28	15	Sept. 2	28
6	July 28	43	16	Sept. 6	24
7	July 30	31	17	Sept. 9	19
8	Aug. 1	39			
9	Aug. 4	52	Total		537
10	Aug. 9	61			

COPPER ISLAND.

Chiefly on account of the intervening Sunday, which was spent at Preobraznenskoye village, we arrived at Karabelni village August 3, in the morning. Mr. Wachsmuth kindly offered to accompany me to the rookery. The wind was southeast, with fog and considerable rain, and the people ashore informed us that it was also foggy and raining heavily on the west side of the island. There being consequently no sense in crossing the mountains to the rookery under these conditions, we waited on board until noon for better weather. In the meantime the wind was becoming more easterly, the barometer was falling rapidly, and the surf on the beach increasing. For that reason, seeing that it might become difficult to land later and that it might even be necessary for the *Albatross* to go to sea, Mr. Wachsmuth and I determined to go ashore, and, taking bed clothes and provisions with us, we installed ourselves in the Government house.

The next morning, with a change in the wind to the northward, the rain ceased. In spite of the fog, therefore, we made up our mind to visit the rookery, even though photographing might be impracticable. As we left the village we saw the *Albatross* get up steam, and standing out to sea she was soon lost in the fog.

KARABELNOYE ROOKERY.

We started out at 6.45 a. m. (August 4) and reached my photographic station No. 1 (Russ. Fur-seal Isls., pl. XII) at 8 a. m. The weather was favorable for viewing the seal, as it was cool, foggy, with an occasional drizzle, but for the same reason exceedingly unfavorable for photographing and for comparing with last year when I viewed the same rookery in bright sunshine.

At the Stolp there were apparently a few more seals than on August 1, last year (1895). In the little corner at the north end of the Stolp, where last year only one old bull with a few females was holding forth, there were now three harems of about 20 cows each, and on the rocks a little beyond to the north there was another harem of about the same size. The females in the harems on the west side appeared also to be somewhat more numerous. Several idle bulls and half-bulls were seen on the gravel beach to the left. Pups were plentiful, and a few were playing in the water, the surf being quite moderate on this side.

We next went to photographic station 2. The same observations were made there. The number of females on the beach was certainly greater than when I inspected the place a year ago. Compared with pl. 40 (Russ. Fur Seal Isls.) it was seen that they were thicker in the inner belt under the bluffs and that they extended farther toward the lower margin of the picture (the creek), but it was also noted that there were less at the water's edge, and that consequently the total difference was comparatively slight.

I counted one-half of the seals on the patch shown in pl. 40 between the margin and the first bluff, and found 436 females in 23 harems, with scarcely half a dozen idle bulls. This shows 19 females to the harem. In round figures the patch therefore contained 900 cows.

Only two small patches of seals were seen sporting in the water at Bolshaya Bukhta, less than a hundred in each.

Arriving at station 4 and looking toward station 2 (Russ. Fur-seal Isls., pl. 38*a*) similar observations were made; and as I had no photographic plate to spare, I sketched the additional numbers in on a copy of the illustration cited.

In passing along the edge of the bluffs toward station 3 I was very particular to verify my assertion that the Copper Island rookeries can not be satisfactorily counted, in view of my experience this year on the Pribilofs where we successfully counted a number of rookeries, and I must reiterate my statement that a count with any pretense at even approximate accuracy is impracticable at Karabelni. There are places where the seals are absolutely concealed, and others again which can only be viewed from such a distance that no count can be made. From a boat it would be equally impossible because of the rocks and reefs which are fringing the rookery. I do not believe that it will be possible to get at more than an approximate figure by an estimate based upon a partial count. Basing my judgment on the size of the patch I have counted as compared with my Pribilof Islands experience, I should regard 10,000 female seals as a great exaggeration, the actual number being probably nearer 6,000 than 8,000.

Beyond station 3 (Nepropusk) there were no more cows, and we only counted 16 bachelors on the cliffs below toward Vodopad. A few bachelors were also seen at Staritchkovaya Bukhta, but none elsewhere.

In comparing to-day's inspection with that of last year (1895) it is but fair to remember that the days upon which I then viewed the rookery were sunny and pleasant and that a great number of the cows were then in the water, while to-day was an ideal day for the seals to stay ashore; just middling cool, a light fog, but no rain to speak of. This difference in the condition dependent upon the weather was also shown by the greater number of seals lying at the water's edge in 1895. The apparent increase this year is so slight that it is safe to say that on the corresponding date of 1895 the number would have been greater than it was this year had the weather been equally favorable from a seal's standpoint.

While it is true that the season (August 4) was too far advanced to make the comparison of the rookeries as satisfactory as it would have been two weeks earlier, yet from the nature of the beaches on Copper Island the animals can not spread out very much and the harems were still pretty well defined. Some bulls might possibly have left already, which may account for the somewhat high percentage of cows per harem. This might seem probable when we remember that 5 of the 6 bulls on south rookery, Bering Island, have already absented themselves, but it must also be kept in mind that the latter are continuously disturbed by the drives.

On the whole I should compare the condition of Karabelnoye rookery with that of North rookery on St. George or Kitovoye on St. Paul.

The marked decrease in idle bulls and half bulls on Karabelni is not to be wondered at when we are told that 65 bulls have been killed off on purpose this year (up to the time of my visit) besides 75 large bachelors, whose skins weighed from 14½ to 18 pounds.

The sad experience of last year had taught the authorities not to expect a very large number of skins and that some lively hustling would have to be done if any were to be got at all. A boat is therefore now stationed in Stolbovaya Bukhta and bachelors were slain and skinned in some of the places where they have been safe heretofore. Hence they had succeeded up to the time of my visit in getting at this rookery 2,049 acceptable skins.

I append herewith some tables showing the number of skins taken at Karabelni and the weights of those taken up to the time of my visit. Also the number of seals on the various dates this spring prior to the first drive. Most of these details were kindly furnished by Mr. Wachsmuth.

Table of fur seals killed at Karabelni, Copper Island, summer season, 1896.

Date (N. S.).	Bachelors.	Females.	Bulls and half bulls.	Not accepted.	Rookery.
1896.					
June 24	288	....	....	6	Stolbovaya.
27	186	....	....	10	Vodopad.
28	573	....	52	38	Do.
July 7	172	2	13	14	Stolbovaya.
16	485	....	....	22	Do
21	208	1	....	2	Stolbovaya and Nerpitcha.
26	56	....	....	....	Stolbovaya.
29	156	1	....	....	Do.
Aug. 20	12	?	?	?	?
21	32	?	?	?	?
25	6	?	?	?	?

Weight of skins taken in eight drives at Karabelni, Copper Island, summer season, 1896.

Pounds.	June 24.	June 27.	June 28.	July 7.	July 16.	July 21.	July 26.	July 29.
5	......	......	14	......	......	......	......	......
5½	......	......	16	7	......	9	......	......
6	5	3	6	7	1	9	......	......
6½	1	7	......	......	......	3	......	......
Total, 5-6½ pounds	6	10	36	14	1	21	......	......
7	17	10	67	50	168	19	3	14
7½	11	13	64	20	91	29	4	19
8	25	13	92	16	52	28	7	22
8½	18	11	67	18	40	27	6	24
9	22	23	88	15	46	32	9	28
9½	25	19	49	4	18	11	6	10
10	27	12	37	11	21	18	6	12
10½	17	13	33	5	8	9	3	2
11	22	14	15	6	13	15	1	13
11½	16	7	9	4	4	5	3	......
12	17	9	22	6	9	8	1	3
12½	11	8	8	2	3	4	2	2
13	10	12	2	3	4	1	......	5
13½	8	4	1	2	3	......	......	......
14	11	6	2	......	......	2	4	2
14½	4	2	4	2	3	......	......	......
15	6	2	3	4	2	......	......	......
15½	3	2	1	1	......	......	......	......
16	5	2	......	1	......	......	......	......
16½	2	3	2	......	......	......	......	......
17	4	1	2	......	......	......	......	......
17½	1	......	4	1	......	......	......	......
18	6	......	1	1	......	......	......	......
Total, 7-18 pounds	288	186	573	172	485	208	55	156
Grand total	294	196	609	186	486	229	55	156

Arrival of fur seal at Karabelni, Copper Island, 1896, as shown by their number on the rookeries at certain dates.

Date, N. S.	Bulls.	Bachelors.	Females.	Remarks.
May 16	1	......	......	Stolp.
16	6	......	......	Bolshaya.
16	3	......	......	Staritchkovaya.
16	2	......	......	Dalnaya.
16	4	......	......	Nerpitcha.
18	45	......	......	
20	37	......	......	
25	79	......	......	
30	113	......	......	
June 4	125	......	......	
7	184	Some.	......	
9	190	......	......	
15	282	500	5	
17	303	......	35	With pups,
21	341	......	127	Do.
24	......	......	......	First drive.

On August 5, although the weather had improved, the surf was still too heavy to allow a boat to be launched for some time. Landing being so bad at Karabelni, it was considered certain that no landing could be effected at Glinka for several days yet, the beach being much more exposed. Word having reached us that it would be possible to launch a boat on the south side, we decided to have our beds and provisions, etc., carried across the island, then pull to Pagani on the south side across from Glinka, and from there carry them again over the mountains to Glinka village. We left word with the natives for Captain Moser, as soon as it should be possible to communicate with the *Albatross*, to pick us up at Glinka in a couple of days.

When we reached the other side of the island at 11.30 a. m. we found that the surf was rapidly increasing, so that we had to make all haste possible in getting out from Stolbovaya Bukhta.

In passing along Karabelnoye rookery a couple of bachelors were seen at the extreme end of the Stolp and a single half bull at Krepki Pad. Judging from a distance, the condition of the rookery was much the same as yesterday, the weather being pleasant, although overcast. Taking the whole rookery in a general view from the boat it seemed plain to me that 6,000 females is the extreme figure allowable for the seals hauled up yesterday and to day.

By means of oars and sail we made satisfactory progress and soon had the northern end of the Glinka rookeries before us.

GLINKA ROOKERIES.

We passed near Lebiazhi Mys and saw the same number of isolated and idle half bulls decorating the beach on both sides of Peresheyekski Kamen as last year. I looked for a place to land, but it was breaking everywhere. We therefore passed slowly along the Urili Kamen rookery as close as seemed prudent.

It was at once apparent that the condition of this rookery was considerably worse than last year. The more compact portion near Urili Kamen showed no decrease appreciable to me at that distance, but the patch near Peresheyekski Kamen was very much thinner and the intermediate patches were completely gone, save 3 or 4 bulls with 1 or 2 cows each.

The Urili Kamen portion is one of the best looking rookeries on the island, the harems being three to four deep, pretty densely located, about like the best portion of Tolstoi rookery on St. Paul Island. There must have been between 2,000 and 3,000 cows to-day on that piece of ground; probably nearer the latter figure.

At the Pestshanaya hauling ground there was a small flock of bachelors, less than a hundred.

A few more half bulls and bachelors than last year were seen at the northern base of Pestshani Mys, but from there to Zapadni breeding ground, including Pestshani Mys and the entire Pagani, not a single seal, except a few ("less than two dozen") bachelors on the beach of the latter just below Cone Peak.

We arrived at our intended landing place in Pagani at 2.30 p. m. The surf broke badly on the steep pebbly beach, but as it was increasing every minute we had no time to look for better places, and so, preparing for the worst, pulled toward the beach. To make a long story short, the boat was thrown sideways on the beach, filled with water, and had a big hole stove into her bottom; we ourselves as well as all our things got soaked through, fortunately with the exception of my photograph outfit, and I myself had one thumb very badly sprained by being thrown violently down. With the greatest exertion we managed to save the boat from utter destruction and by taking advantage of each succeeding breaker to drag it sideways out of the surf and to a place of safety. A boy was sent to the village for the men to carry our things over the mountains. Wet and exhausted, we arrived at Glinka village about 4 o'clock p. m.

The morning of August 7 greeted us with blue sky and fine sunshine, and at 7.30 a. m. our party started for Palata.

Arriving at the "806 feet" station, I took photographs of Palata and Zapadni, and then climbed down several hundred feet to the right to get a view similar to Voloshinof's view of Palata (Russ Fur Seal Vol., pl. 53*a*).

At Palata there was evidently a very great shrinkage since last year. The harem runway up the gully was not continuous any more, but consisted of a small upper patch and a larger one at the lower end (pl. 70). The patches of seals along the beach between Palata and Sabatcha Dira were now entirely disconnected, and the nearer one at the mouth of a little stream from the killing ground is now known as Dopalata.

Zapadni, viewed from the same standpoint, shows also considerable falling off, the eastern end having shrunk considerably. Owing to the distance at which these rookeries have to be viewed it is difficult to express an opinion as to their condition, but it seemed to me as if there were fewer idle bulls than last year (pl. 71).

Zapalata seems to have suffered less than the others and looked very much like last year. In fact, there were a few more harems on the large flat rock and there appeared also more on the beach. On the other hand, there were less seals in the water than last year (pl. 14).

From Zapalata we went down to where the waterfall runs over the edge of the bluff into Gavarushkaya, or rather into "Vodopad," as the portion of this rookery is called, and found it much the same as last year. The conditions are similar to those at Zapalata.

During 1896 bachelors have been taken at this place from among the breeding seals, access having been gained partly by boat and also by means of a rope located at this point, by which the men have let themselves down and up.

Looking east (pl. 12), a few harems were seen on the rocks this side (west) of Gavarushki Stolp. At Babinskaya only half a dozen idle bulls and half bulls can be seen, consequently fewer than last year.

I think it might be possible to count the breeding seals in these two places, viz, Sikatchinskaya and Gavarushkaya (Vodopad).

The latter place is also the most favorable for viewing the Commander Island seals more closely, and I have convinced myself that the color of the cows is considerably and appreciably darker than in the Pribilof Island cows.

It was quite noticeable at this point that the sunshine alone did not affect the seals disagreeably. They were stretched out at full length, allowing themselves to be baked through without any attempt at getting into the shade or into the water off the rookery and nearly all the cows seen had dry fur.

The *Albatross* arrived off Glinka that same evening, and as I had been over the whole rookery ground and the surf had gone down sufficiently to allow the launching of a boat, I at once boarded her.

Before closing this chapter on Glinka rookeries I may mention an occurrence which Mr. Wachsmuth related to me. On June 30 (new style) 1896, a large flock of bachelors, probably as many as 2,000, had been observed hauled out on the east side of the peninsula near southeast cape of Copper Island, but as the surf was too heavy at the time they could not be captured. A few days later, when the people came to take them, they had already disappeared.

This goes to show that a flock of bachelors may occasionally, by reason or stress of weather or other conditions, haul out temporarily in a place not habitually visited by them. The very fact that this caused such a stir among the natives is proof enough of its unusual character.

Mr. Wachsmuth also kindly furnished me with the following data concerning the killing, weight, and arrival of seals at this rookery for 1896 up to the time of my visit.

Table of fur seals killed at Glinka, Copper Island, summer season 1896.

Date, N. S.	Bachelors.	Females.	Bulls and half bulls.	Not accepted.	Rookery.
1896.					
June 29	211			2	Zapalata.
30	444			34	Sikatchinskaya.
July 2	44		8	1	Do.
7	1,028			52	Pestshani and Urili Kam.
8	21				Pestshani and Urili Kam (found on road).
17	601		23	21	Palata and Sabtcha Dira.
19	147				Zapalata.
19	311			5	Babinskaya.
21	478		41	14	Sabatcha Dira.
24	308				Palata.
24	90			10	Zapalata.
Aug. 1	50		34	1	Palata.
1	92				Zapalata.
4	51			1	Palata.
8	418	?	?	?	?
16	103	?	?	?	?
21	39	1	?	?	?
25	78	?	?	?	?

Weight of skins taken in ten drives at Glinka, Copper Island, summer season 1896.

Pounds.	June 29.	June 30.	July 2.	July 7.	July 17.	July 19.	July 21.	July 24.	Aug. 1.	Aug. 4.
5										
5½		2								
6	1	8		15		4	1			
6½	1	21	1	21	7	1	13	3		
Total 5½–6½ pounds	2	31	1	36	7	5	14	3		
7		38	4	91	36	15	50	30	10	2
7½	4	28	7	108	50	24	66	40	14	7
8	7	92	4	175	92	41	79	57	27	8
8½	5	49	2	108	87	38	55	43	12	5
9	14	52	2	146	89	60	68	50	21	5
9½	23	36	3	111	61	55	40	41	11	5
10	22	31	9	100	65	52	28	41	11	6
10½	12	25	3	30	31	28	25	23	11	1
11	28	32	2	61	25	46	17	19	8	3
11½	12	11	2	18	14	18	6	15	2	
12	16	17	2	33	22	27	15	5	4	
12½	11	11		13	4	10	6	6		3
13	14	10	3	15	9	10	11	13	3	1
13½		8		5		7	5	5	2	1
14	10	4	1	5	5	5	3	5	2	1
14½	7			2	2	3	2	1	1	1
15	8			4	2	3	1	1	1	
15½				1	2	1				
16	8			4	2	5		3	1	2
16½	10			5	1	3			1	
17				3		3			1	
17½				2		4				
18					2		1		1	
Total 7–18 pounds	211	444	44	1,049	601	458	478	398	142	51
Grand totals	213	475	45	1,085	608	463	492	401	142	51

Arrivals of fur seals at Glinka, Copper Island, 1896, as shown by their numbers on the rookeries on certain dates.

Date (N. S.).	Bulls.	Bachelors.	Females.	Remarks.
May 16	4			Vodopad.
16	2			Sikatchinskaya.
16	16	10	3	Zapalata. } The so-called female disappeared later.
16	10			Palata...
16	5			Dopalata.
16	2			Zapadni.
16	2			Babinskaya.
21	76	30		
25	121			
21	187	65		
June 8			31	Some pups.
12	475	275	40	
14	655	1,000	103	
29				First drive.

NORTH ROOKERY, BERING ISLAND.

Anchor was dropped off Sivutchi Kamen, north rookery, at 8 a. m. August 8, but it was blowing so hard from shore that we deemed it impossible to pull a boat ashore against it. By 4 o'clock in the afternoon it had moderated somewhat, and as there were no signs of any speedy improvement in the weather I determined to go ashore in spite of the rain.

We were met on the beach by the Kossak, Alexander Selivanof, and the former Starshena, Peter Burdukovski, and learned that Mr. Barrett-Hamilton was then in Nikolski.

I inspected both the Reef rookery and Kishotchnaya, and in spite of the weather made an attempt at photography, a somewhat useless proceedure, however, first because there was nothing but empty beaches to photograph, and second, the plates in that light would hardly receive any impression of the empty beaches themselves.

Selivanof told me that there had been the usual lack of old bulls, but that there were plenty of females. As to the correctness of this latter statement I had no means of satisfying myself, for the rookery—except the rocks—was nearly deserted, most of the females having been driven into the water by the rain, and even a great number of the pups were in swimming. On the rocks, however, there were a great many, even on some of the nearer eastern ones, where no harems ever locate. Bachelors were not in evidence. The conditions at Kishotchnaya were similar. The harems were long since disorganized, and it was evidently too late to make any effective comparison, especially by photography. I am inclined to believe, however, that, so far as the cows are concerned, the conditions are not appreciably different from what they were last year, and I have no doubt that Selivanof was correct in stating that there were no more bulls than usual.

As for the bachelors, it will be seen that up to date (August 8) nearly 3,400 had been obtained. Last year 5,139 had been killed by August 8, so that the outlook for a catch even as large as last year's is extremely slim. As a matter of fact, the total when the season closed in August 31, 1896, was only 6,098 as against 8,370 in 1895.

I append a table showing the drives and numbers killed up to the time of my visit, kindly furnished by Mr. Grebnitski, also tables of details of all the drives and the weights of the skins taken.

Table of fur seals killed at north rookery, Bering Island, June 17 to August 5, 1896.

Date (N. S.).	Bachelors.	Females.	Undersized.	Bitten.	Where taken.
June 17	192	......	......	......	Sivutchi Kamen.
25	46	......	......	1	Do.
25	78	......	......	......	Reef.
July 2	83	1	......	......	Do.
2	152	......	......	......	Sivutchi Kamen.
2	43	......	......	......	Kishotchnaya.
8	118	......	......	3	Reef.
8	67	1	......	......	Sivutchi Kamen.
16	49	......	......	......	Do.
16	448	3	5	2	Reef.
16	39	......	......	......	Kishotchnaya.
20	49	......	......	......	Do.
20	64	......	......	......	Sivutchi Kamen.
20	215	2	1	......	Reef.
25	467	3	......	......	Do.
25	65	1	......	......	Sivutchi Kamen.
25	178	1	......	......	Kishotchnaya.
Aug. 5	264	......	......	......	Do.
5	635	......	......	......	Reef.
5	120	......	......	......	Sivutchi Kamen.

Details of the drives on north rookery, Bering Island, 1896, showing sex and age of seals driven.

Date.	Killed.	Escaping.				Total driven.	Remarks.
		Females.	Yearlings.	Pups.	Bulls.		
1896.							
June 17	192	11	......	......	6	209	
25	125	282	......	......	8	415	
July 2	279	488	......	......	6	773	1 female killed (skin, 10 pounds).
8	189	522	1	......	8	720	1 female killed (skin, 11 pounds).
16	446	1,852	......	15	13	2,326	3 females killed (skins, 10 pounds).
20	332	1,654	12	95	14	2,101	1 female killed (skin, 8 pounds).
26	715	2,083	59	281	25	3,163	5 females killed (skins, 9 and 11 pounds).
Aug. 5	1,028	2,034	67	20	34	3,183	
15	1,120	1,014	225	156	11	2,526	
20	902	1,343	220	653	24	3,142	
31	682	1,234	162	305	17	2,400	114 "damaged" (stagy?).
Total	6,010	12,517	746	1,525	166	20,964	
Percentage of total driven	28.65	59.73	3.55	7.27	0.80	100.00	

Weight of skins taken on north rookery, Bering Island, 1896.

Date.	6 pounds.	7 pounds.	8 pounds.	9 pounds.	10 pounds.	11 pounds.	12 pounds.	13 pounds.	14 pounds.	15 pounds.	16 pounds.	17 pounds.	Total.	Average.
1896.													*No.*	*Lbs.*
June 17	......	......	7	38	27	42	15	21	30	12	......	......	192	11.4
25	......	......	12	21	20	10	18	110	20	10	4	......	125	11.5
July 2	......	......	67	84	30	38	18	21	19	2	......	......	279	10
8	......	15	86	40	27	7	1	2	1	1	......	......	189	8.7
16	5	64	116	104	39	40	20	32	15	5	6	......	446	9.4
20	1	55	120	80	41	17	7	5	4	2	......	......	332	8.7
26	......	30	212	193	151	60	32	10	9	8	10	......	715	9.4
Aug. 5	......	235	452	203	84	24	10	11	3	4	2	......	1,028	8.4
15	3	312	454	247	69	18	4	7	1	4	......	1	1,120	8.1
20	4	250	365	166	61	19	14	13	3	5	2	......	902	8.3
31	2	142	290	148	58	21	7	2	3	2	4	3	682	8.4
Total	15	1,103	2,181	1,333	607	296	146	134	108	55	28	4	6,010	9.3

The last two tables are highly interesting and instructive, viewed in comparison with the corresponding ones for 1895 (pp. 139 and 140).

With regard to the weight, it will be seen that the average in 1896 was a whole pound lower than in 1895, in spite of the fact that skins up to 17 pounds were taken. The lower average is due to a great falling off in the 10 to 13 pound skins and a corresponding increase in those weighing 7 and 8 pounds. It will be noticed that this increase in the smaller skins is particularly great after the 1st of August. This agrees well with the known fact that the younger seals arrive on the rookeries later than the older ones.

The table of the details of the drives during 1896, showing the proportionate number of sex and age of the seals driven, demonstrates that the driving of females and young—in other words, the scraping of the rookery in search of killables—has been going on in 1896 much as in the year previous. The percentage of females appears to be somewhat smaller, due in a measure to the fact that the table for 1896 includes all the drives, even the earliest, when the proportion of females is less, but that of the pups, on the other hand, is very much greater.

Foreseeing that it might be impossible to make a landing at Nikolski the following day, and that consequently, on account of the advanced season and the low state of our coal supply, it might be necessary for us to proceed directly to Petropaulski, I left with Selivanof a letter for Mr. Grebnitski, regretting the fact that we might have to forego the pleasure of bidding him personally farewell, and thanking him for our reception and treatment while on the islands.

Had time allowed, it had been my intention to visit the alleged fur-seal rookery on the coast of Kamchatka, but for the reasons given above we had to go at once to Petropaulski, Kamchatka, where the *Albatross* anchored on August 11.

DR. D. S. JORDAN'S NOTES ON THE GLINKA ROOKERIES, COPPER ISLAND, 1896.

Dr. Jordan, in charge of the fur-seal investigation, made a short visit to the Glinka rookeries on August 25, 1896, during which he was enabled to make some valuable observation on the starving pups. It will be observed that during my own visit, shortly before, I was not in a position to continue my own observations of 1895 with regard to the mortality of the pups. In the special chapter relating to this subject (p. 106) I have called attention to the fact that both the natives and the local authorities evinced a strange inclination to treat this whole subject lightly, even to the extent of trying to explain away my observations in 1895 on Bering Island. Dr. Jordan also experienced this same reluctance to admit that pups are starving on the rookeries of the Commander Islands. His observations, doubly valuable because they were made in company with the British commissioners, are herewith appended as proof positive of the state of affairs which I pointed out last year. Of course, the starvation of the pups does not assume the same startling obvious proportions as on the Pribilof Islands. The pelagic sealing around the Commander Islands of late years is decreasing, and I have elsewhere given the reasons for the fact that the phenomenon is much more difficult to observe on the Commander Islands.

DR. JORDAN'S FIELD NOTES.

STARVED PUPS.

August 25.—Zapadni rookery, of Medni Island, is a stretch of coarse shingle and rounded rocks on a sloping beach at the foot of very high cliffs. In the sea are large rocks, on which the female seals are now mostly gathered. On the shore are a small pod of females and a number of groups of pups. No males, young or old, appear.

In the first little pod of 20 pups, 6 are evidently starving; 8 recently starved dead ones lie there, and there are 4 dead ones of older date, but also emaciated.

Zapadni rookery seems not much larger than Little Polavina, of St. Paul. On the rookery ground are 11 fresh starved pups, besides 14 which seem, some of them at least, to have been starved, but which are now largely decomposed.

There are many carcasses of dead seals on the beach nearly devoured, and dense swarms of small flesh flies abound, their maggots destroying a dead pup or dead seal carcass very quickly. Evidently of the very earliest pups only fragments remain. The air seems drier and warmer than on St. Paul, and a dead pup remains fresh only for a short time. Many which have not been more than a week dead have been reduced to skeletons and hair.

A pod of 46 pups on shore is examined. As a whole they seem much less active than Pribilof pups, smaller, sleepier, and more stupid. Seventeen of the number are evidently starving. Some look plump, but it is probable that nearly all of these land pups are really starving; the large and well-fed ones have taken to the water.

Other pods show similar characteristics. In a group of some 200 about 80 are evidently starving. This is not a count, but a rough guess. The percentage in general holds for all groups examined.

In this record no effort was made to get full counts for lack of time. I have only noted what I saw. It is very clear that the starving pup is in fullest evidence on the Glinka rookeries. On these rookeries trampled pups must stand at the very minimum because the rookeries are narrow and rocky, preventing massing, and bulls are few. There is little chance of drowning.

One [illegible] in the water has crawled upon a rock about 10 feet from the shore to die. The rising tide will drown him if he doesn't starve first.

On the edge of the slide at Palata is a little brook which has worn a small gully and which is doubtless responsible for the slide itself. In the brook were 4 dead starved pups, and in a pod of 150 lying near it at least 50 more are starving.

The governor of Medni Island seemed rather sensitive on the subject of dead pups, as though he felt that he might be taken to task for it. He spoke of the trampling of bulls as the cause. I tried to throw the blame on the pelagic sealers, and expressed my hope that wise arrangements might put a stop to the loss. But it would seem that the authorities think the less said the better on this subject.

It is probable that most of the pods of pups along the beach are made up of starving ones, the strong ones being in the water and on the bare outlying reef. Even a fairly plump one seemed dull and dwarfish, while among the others are all stages of emaciation. The excessively numerous beach flies make quick work of the bodies.

Separating Palata from Zapalata is a huge wall of cliff, at the foot of which, on the Zapalata side, is a number of parallel or knife like reefs which extend well out to sea, bare at low tide, and now black with seals and pups, the females almost as dark as the young. The pups find excellent places for swimming between the reefs. A good many are scattered about over the slide which forms the rookery, mostly asleep, while many are crowded on the beach below.

On the detached north end of Palata 42 dead starved pups were noticed, with 24 other dead ones mostly showing emaciation, but more than a week old, so that they can not be investigated. This rookery, like the others, is one on which very few pups would be trampled.

One fresh pup, not emaciated, at the edge of the sea, has apparently drowned. This is the only pup seen in condition to be examined in which the death was obviously not due to starving.

AUTOPSIES.

1. *Zapadni.*—Young male pup cast up by waves. Perfectly fresh; no trace of subcutaneous fat; lungs greatly congested, crepitate; no trace of water in them; heart normal, with some unclotted blood; liver very dark red; spleen purplish; stomach and intestines empty, except the lower part, which contains the dark-green tarry matter; gall bladder nearly empty; kidneys deeply congested, the left most so. Evidently starved, not drowned.

2. *Zapadni.*—Female; wholly devoid of subcutaneous fat; vent foul with black tarry matter; lungs deeply congested, not crepitating; intestines pale, empty, except for fluid brown bile; stomach empty, with mucus and bile; kidneys slightly congested, the left most.

3. *Sabatcha Dira.*—Male; no subcutaneous fat; lungs excessively congested, almost black, not crepitating at all; heart normal, with some blood; liver very black; left kidney much congested, the right a little; intestines with tarry bile and slime in lower part only.

4. *Sabatcha Dira.*—Male; lungs greatly congested, crepitate; no fat; liver dark; black matter in lower intestines as usual, the alimentary canal otherwise empty; kidneys congested, the right most so; heart normal, with some blood.

DRIVEWAYS.

Zapadni driveway: The drive from Zapadni goes up from the stony beach between two towers of rocks, climbing the gorge of a little brook which cuts into the bowlders and clay of the hillside, an excessively hard, rough little gully, very difficult for a man to climb, there being small cascades and wet clay in its course. The way is marked by road skeletons (pl. 13).

After an ascent over ground of this sort for 300 or 400 feet, more or less, the drive goes up through steep grassy slopes, some of them of soft clay, somewhat cut into rough steps by men's boots. The general character of the ground is unrelieved, although more or less broken by cross gullies and ridges. The final ridge is 760 feet above the sea.

On the Glinka side is a long slope, at first quite steep, everywhere grassy and rather easy, but marked with road skeletons, as it is very long. The rye grass grows longer below, and a little stream has deep depressions, which serve as death traps, as the skeletons show when the seals fall in piles over one another. Above Glinka is a steep slide of yellow clay, from which the village is said to have received its name. This slide must be a hard place for the seals. The seals (few in number) that are released because too young or too old are allowed to go down to the sea, whence they go back to the west side again.

Palata driveway: The drive from Palata is now rarely made, as the seals have grown so few. They are killed all along the beach, and the myriads of flies about the decaying carcasses must be the source of great annoyance to breeding seals.

The drive ascends from the parade ground on the top of the landslide. This was formerly occupied by bachelors. But there are no separate droves of bachelors now. They are scattered in little clumps about and between the rookeries.

The drive then for about 100 feet ascends a grassy cliff so steep that steps have been dug in it to facilitate climbing. Then follows some 700 feet of irregular but very steep slope, in which the easiest depressions are sought, though the hill is everywhere about as steep as a man can climb, and one who goes up it must cling to the grass. Above this slope the drive reaches the back of the knife-like ridge that separates Palata from Zapalata. This widens out into an easy level plateau for about 20 rods, marked with road skeletons. The elevation is 850 feet by Dr. Stejneger's map.

Then follows a steep climb up gravel and clay, with scanty grass and heather, worn into steps, the driveway bounded on the southwest by a slanting precipice that lies above Sabatcha Dira. A steep shoulder of heather and small plants is followed by a final climb into the clouds to the summit of the pass, 1,220 feet above the sea.

From the summit an abrupt descent leads down a distance of 500 feet by a zigzag trail as steep as a horse could pass over, strewn with gravel and covered with low flowers, to the bed of a swift little brook. This stream flows down into a grassy basin, the slope becoming less and less, the rye grass and putchki growing taller. At the junction of this stream flowing into the little brook to the west this drive merges into the one from Zapadni.

The drive from Palata is not in any place so difficult as the gully just above Zapadni, but it is half higher and twice as long—a trip one could not take on horseback, nor would it be easy to lead a horse over it. Comparing it with conditions on St. Paul, the Palata Pass is as steep as the cone of Bogoslof, twice as high, and is without water. Compared with the severest drive on St. Paul, it would stand as the ascent of Mount Blanc to a walk in the park. It is a very fatiguing trip for a man. It took me, walking rapidly, thirty-eight minutes (deducting stops) from Palata to the grassy level, 860 feet; thence twenty-eight minutes to the top, 1,220; fifteen minutes down the upper slope, and fifteen more to Glinka.

CONDITION OF THE COMMANDER ISLANDS FUR-SEAL ROOKERIES IN 1897.

The inspection of the Commander Islands rookeries during 1897 was beset by many difficulties and was at times not devoid of danger, chiefly on account of the lack of proper means of transportation. It is greatly to be regretted that no vessel could have been spared from the United States Revenue Service or Navy to stay about the islands during the sealing season. Much more work could then have been accomplished and much valuable time have been saved, which was now lost in waiting for the uncertain visits of the foreign men-of-war or the company's steamer. It must be remembered that the coasts of these island have no harbors, that the weather is usually stormy and foggy, that the rookeries are situated 12 to 20 miles away from the villages, and that landing at these places is often impossible or dangerous for weeks at a time. Thus the steamer *Kotik* this year was forced to return to Petropaulski without having been able to land boats at the rookeries of Glinka and Karabelni, on Copper Island, although she was more than three weeks attempting the feat.

Coasting in small open boats along these stormy islands is neither pleasant nor without danger. It thus took us five days to make the distance of 20 miles from Nikolski to South Rookery, on Bering Island; five days of storm, heavy swell, rain, dangerous surf, and long, weary, wet nights on sandy or rocky beaches, with no other shelter than the overturned boat. Nor was the sail from Preobrazhenskoye to Glinka and back without its hardships. Then the long, dreary waiting for the ships, the arrival of which can not be known beforehand within weeks, with the necessity of being present and prepared to embark immediately. Under such circumstances work is difficult and at times impossible, and the trip, which in addition involves rough passages at sea for weeks and weeks in vessels not meant for passenger transportation, is anything but a pleasure excursion.

BERING ISLAND.

North Rookery.—It will be remembered that in "The Russian Fur-Seal Islands" I made it a point that, while the Copper Island rookeries in 1895 showed tremendous falling off in the number of breeding females as compared with what I saw there in 1882–83, the North Rookery of Bering Island was much less affected, although, of course, a great diminution was quite perceptible even then. As an evidence I mentioned the general outline of the breeding mass of seals, and more especially a characteristic feature of the same, viz, a "band" of harems across the northern end of the "sands." This "band" was well shown in photographs taken both in 1885 and 1895.

In 1896 my visit to this rookery was so late that I had no opportunity to institute an intelligent comparison with the conditions of 1895, but during the present year (1897) my inspection was contemporaneous with that of 1895, at the height of the season, and consequently fully comparable.

As a result of this inspection, I am able to demonstrate a very great decrease in the breeding females on north rookery since 1895.

This rookery was visited by me twice during the height of the season of 1897—first on July 13, in company with Prof. D'Arcy Thompson and Mr. Barrett-Hamilton; the second time on July 16, in company with the latter gentleman.

On July 13, at our first visit, the weather was very warm, probably as much as + 64° F., with bright sunshine, and at the time of our inspection it was very low water.

Quite a large number of females were in the water off the Reef Rookery, but even allowing liberally for these it was at once evident that the number of females had greatly decreased since I inspected the rookery in 1895. The characteristic outline of the breeding mass had not only disappeared, there being hardly a trace of the "band," but there was a general thinness of the ranks, and the "massed" patches had shriveled up to an ominous degree. The best portion is still the western side of the "sands," but even here the decrease was noticeable, while to the north of this the density showed the greatest falling off. The "sands" were fringed all around, though on the east side there were now actual breaks in the continuity of the line. As already noted, a large number of females were in the water off the rookery, both on the western and eastern side of the Reef. However, on July 15, 1895, the date when I photographed this rookery, the weather conditions were exactly similar, viz, a hot, sunshiny day, with hardly a breeze stirring, and the seals in the water were then equally numerous. (See pl. 22, Russ. Fur Seal Isls., and the note referring to the same in the list of illustrations, p. 138.) The conditions are, therefore, absolutely comparable.

It was noted that the pups had already podded to some extent, but the season was equally far advanced on July 15, 1895.

Professor Thompson suggested that we make a rough estimate of the number of females actually on the ground (agreeing, as he did, with me that a regular count of this rookery is impracticable). We consequently counted independently a section of the eastern base of the "sands," and both found it to contain about 600 females and 10 bulls. Professor Thompson's estimate that the total occupied area of the rookery is fifteen times greater than that of the seals counted is possibly not very far from the truth, the result being about 9,000 to 10,000 females then on the rookery, and about 150 bulls.

We could not get close enough to the seals to ascertain whether there was any great mortality among the new-born pups on the rookery ground proper. On the western edge of the Ladiginski Peninsula we counted about 15 dead pups, most of them with the hair already off. Mr. Barrett-Hamilton suggested that some of them might have died in yesterday's drive (the first drive during the season), but the hair on the best preserved pup was already quite loose, and we all agreed that it had been dead for several days.

We next went to Kishotchnaya, and found there a similar state of affairs. There was not a seal above the steep bevel of the beach; not one on the upper, flat, shingly portion which I have called the "parade." In 1895 the two lateral sections of this rookery extended a considerable distance backward, leaving the middle section bare to the bevel, but all the harems situated there had now disappeared, and the number of seals appeared nearly one-half less. In 1895 I had to keep well concealed behind the large stone so as not to disturb the nearest harems, which were scarcely 10 yards away. To-day Professor Thompson stood upright on the top of this rock without the seals on the beach even noticing his presence.

A cursory and rather superficial count of the females gave about 600 for the northern and 700 for the southern section. Allowing 900 for the middle section, the total was about 2,200 females, certainly a maximum estimate.

During our visit three days later, July 16, 1897, there was no change in the appearance of this part of the rookery (Kishotchnaya) except that there were but very few seals in the water, and a correspondingly large number on shore. On account of the unfavorable wind the guard whom the starshena sent with us would not allow us to go as far as we ourselves deemed safe and prudent. Mr. Barrett-Hamilton being very anxious to have a count of this rookery made as far as practicable, I agreed to undertake it jointly with him, though protesting that the conditions were such that not even an approximately accurate count could be made. I willingly admit, however, that on account of the great reduction in the number of the females since 1895, a count is somewhat more feasible now than then. For this count I can claim no more accuracy than for a well-considered estimate based upon my experience in actually counting and estimating the rookeries on the Pribilof Islands, and it is of no value except as a check upon such an estimate.

We divided the Kishotchnaya rookery into three sections, according to whether the seals were lying outside the two rocky ledges or between them. We counted each division separately and compared the figures. For the first section (the southern), which could be observed best, our count agreed very closely (viz, 660 and 665), but for the two others Mr. Barrett-Hamilton's figures were considerably below mine (about 300); mine being the higher ones, he accepted them. Following the various groups of female seals in the binocle I could distinguish in the

	Seals.
South section (43 + 665)	708
Middle section	1,034
North section	848

Total (Kishotchnaya), 2,590 female seals, or, in round numbers, 2,600 females. No allowance was made for seals which could not be seen. The number of these can only be guessed at, but including the very few seen in the water it is probably safe to say that there were altogether nearly 3,000 female seals on Kishotchnaya on July 16, 1897. This is also the figure I should have estimated offhand, and agrees pretty well with the estimate made July 13, viz, 2,200, and the large number seen in the water off the rookery. Eight hundred seals in the water occupy a large area, and this figure is probably over rather than under the actual number seen by us that day.

Three thousand, then, will about represent the maximum number of females present at any one time during the height of the season at Kishotchnaya, as the day was an ideal one for the seals to remain ashore. The weather was perfect, comfortably cool, cloudy, no rain, wind light southeast, half water, rising tide.

At the Reef we found on the 16th the same state of things as on Kishotchnaya, viz, a denser accumulation of the females on shore and none to speak of in the water; consequently the rookery looked fuller than it did three days previously at our first visit, and the gaps between the patches appeared more or less closed up. The capacity of Reef rookery for this season (1897) was undoubtedly at its highest to-day, yet that characteristic "band" across the "sands" was not there, not even a trace, as the few individuals which we had noticed on the 13th had now left it. Nothing attests better the decrease of this rookery since I visited it in 1895.

Another point brought out by my inspection of the Bering Island rookeries in 1895 was the relative dearth of old bulls as compared with the condition on the Copper Island rookeries. The disproportion of the sexes was still evident on North Rookery in 1897, though much less marked than in 1895, on account of the decrease of the females. It would be waste of time and paper to try to present figures to demonstrate it, as the counts that have been made are utterly worthless. There may have been 150 bulls on the Reef this year, or there may have been 200; there is no way of telling with certainty. The rookery had of necessity to be watched from such a distance that only a fraction of the bulls can be seen.

On Kishotchnaya the conditions are somewhat better, but the result of our count is not very satisfactory, as a recital of our experience on July 13 will show. The fact is, that the bulls are often so concealed while lying down among the females that it is impossible to see them, unless they are roused so as to stand up, and such a rousing can only be affected here in a few instances. A count of the bulls actually seen is therefore sure to be considerably under the true number. This was very forcibly shown during our inspection of Kishotchnaya on July 13. We had counted 7 bulls in the southern section, when Mr. Rodger, Professor Thompson's assistant, accidentally stampeded a portion of the females. At once 3 bulls, hitherto overlooked, got up in full view, and Rodger, to use Mr. Barrett Hamilton's own words, "by stampeding them added 3 bulls to my list."

The general proposition, however, that there are still proportionally much fewer males on Bering Island than on Copper Island holds good (even after the killing of a number of them last year on the latter island) and is conceded by all.

Whether this comparative dearth of males on Bering Island is particularly injurious to the condition of the herd will find a negative answer in the South rookery of Bering Island, as suggested by me on page 64 of my Russian Fur-Seal Islands.

South Rookery.—In view of the above suggestion I was ordered to pay special attention to the South Rookery during 1897.

There being no inhabitable house at this rookery, we were obliged to camp in the neighborhood, and from July 24 to 30 we (Mr. Barrett-Hamilton and myself) visited the rookery two or three times a day.

It will be remembered that this rookery is very small and situated under a steep bluff, which makes it possible to count the seals with some degree of accuracy. My visit in 1895 was too short to allow an actual count of the females, but I estimated their number at "about 600," while the maximum number of sikatchi, or bulls, was said by good authority to have been only 5 during that season. In my report upon that visit I urged the advisability of undertaking an exact count of the young ones the following year, in order to ascertain whether these few bulls had been sufficient for the impregnation of the whole number of females. I myself arrived too late in 1896 to be able to do it, and nobody else took up the suggestion. It was ascertained, however, that no more than 6 sikatchi had frequented the rookery that year.

In 1897 Mr. Barrett-Hamilton agreed to undertake the count in common with myself. At first we intended to drive the pups off in a body and count them in that way, but there were various objections to this plan; first, that the driving would materially interfere with the sealing at this rookery, the bachelors hauling up among the females and being culled from among these; second, that so many of the pups were in the water during the day (at low water) (pl. 68) that it would be impossible to gather them all together on land, while in the evening, when they all came ashore, water was high (pl. 69), thus preventing any driving at all. We relinquished this plan the more willingly as we found it quite feasible to make a fairly accurate count from the bluff overlooking the rookery.

Our general mode of procedure was first to define small separate groups of pups on shore and to count each one of these separately, then compare our figures, and in case of disagreement to count them over and over again until we arrived at nearly the same figures. We then counted those lying among the females nursing, those on separate rocks in the water, and those swimming. After a series of counts we found that only those made in the evening at high water, when all the pups were ashore, were of any value (pl. 69). An average of a selection of our best counts (7) gives 526 pups (minimum, 516; maximum, 533), which may be accepted as nearly exact.

Similar counts of the females were made regularly. As a matter of course, the figures for the various counts of the females vary very much more than those of the pups for two obvious reasons: First, because the actual number of females present on the rookery varies greatly from day to day, while that of the pups is constant, except for the gradual increase due to new births or slight decrease due to death; second, because there nearly always were a number of females swimming off the rookery (pl. 67), the number of which had to be more or less closely estimated. Nevertheless, the average of nine of our best counts may be taken as a fair daily average of the breeding females present at this rookery during our visit in 1897, this average being 449.

The experience of last year on the Pribilof Islands, where it was found that the number of pups on the rookeries was nearly twice as great as the number of females counted as present in the harems at the height of the season, had prepared us for the above results, viz, a greater number of pups than of cows counted. On the other hand, it would be very erroneous were we to take the above number of females and to that apply a correction derived from the census of St. Paul Island, in order to find out the number of pups which ought to have been on the South Rookery in 1897, for the reason that the above figure of 449 females also includes all the seals that were seen in the sea off the rookery in addition to those in the harems on shore. The average number of females on shore (nine counts) was about 236 (maximum 395, minimum 174).

Only 2 full-grown bulls attended to this rookery. A young bull, or polusikatch, was observed occasionally on the outskirts of the two harems, but his visits were not regular, and when there he was only attended by a couple of cows. The two bulls were also unevenly matched, for it was evident that the larger and apparently older bull had the greatest attraction in the eyes of the cows, as most of the 500 females belonged to his harem. I do not believe that more than a dozen cows were the legitimate property of the younger bull. One evening (July 28) he was quite alone, separated from the other harem, consisting of 174 females, by a pod of about 300 sleeping pups. Astounding as it appears, there can be but little doubt that the single old bull had served the great majority of the 526 females on this rookery and, moreover, was in fit condition to keep the younger bull at a respectful distance as late in the season as July 30.

For 526 pups to have been born on this rookery in 1897 the 6 bulls which were there in 1896 must have been sufficient to impregnate probably at least 750 cows, as a number of the latter were undoubtedly killed during the pelagic sealing in the autumn of 1896 and spring of 1897, besides those perishing from other causes during the winter migration. This result sets definitely at rest any fears that may have been entertained respecting the sufficiency of the male element now doing duty on the North Rookery of Bering Island

Copper Island.

Glinka rookeries.—Owing to the lack of means of transportation, I was unable to reach the Glinka rookeries until August 20. A detailed and conclusive comparison with the conditions of these rookeries in 1896 and 1895 is therefore out of the question. The beaches were now to a great extent occupied by the newly arrived yearlings and 2-year-old virgin cows (pl. 64); yet it was quite possible, in places at least, to judge of the extent of the harems during the earlier part of the season. From such observations as I was enabled to make I have no hesitation in saying that the year 1897 shows some decrease of the seals observed by me in 1895, though not nearly as great in proportion as the falling off in the breeding areas on Bering Island North Rookery.

Under the circumstances, it would be useless to go into details, but I may say that the places where I noticed a diminution in the area occupied by the seals were at

Zapadni, south end of rookery (pl. 73); at Palata, where I found that the seals had almost abandoned the brow of the clayey bank to the north of the gully and the elevated flat ground between the latter and that bank (pl. 72); also at Zapalata I noted conditions indicating a falling off both at the western end and at the middle portion of the eastern end; at the rookery of Urili Kamen the middle portion seems to have disappeared.

My observations relative to the falling off of the Palata breeding grounds are verified by a photograph by Mr. N. N. Lukin-Feodotitch, the Government overseer at Glinka, taken on July 28 (new style).

The overstocking of these rookeries with bulls and half bulls was startlingly evident, in spite of the lateness of the season. On all the abandoned breeding grounds there were groups of solitary bulls to be seen, while among the female seals, old and young, there was a large quantity of young bulls imitating the performance of the older sikatchi during the early part of the season. The killing of 172 superfluous bulls during 1896 does not seem to have had much effect; the number was too insignificant in proportion to those that were left, and during 1897 no bulls at all were killed off. This is greatly to be regretted, for while it is quite true that there is not the same chance of trampling to death of the newborn pups as in certain other rookeries, there are, nevertheless, a number of pups killed in this way, and the presence of this superfluity of males on the breeding ground is certainly not promoting the best interest of the rookeries.

MORTALITY OF PUPS.

Up to the end of our stay at South Rookery (July 30) no startling mortality was visible there. Early trampling to death was almost out of the question, and if any newborn pups died in this or any other way the bodies had been eaten or carried away by the blue foxes. During our stay we observed only three or four dead pups. Mr. Barrett Hamilton on the last day secured three of these, but on account of our sudden departure no autopsy was made. This was hardly necessary, for the bodies were exceedingly emaciated and the rectum contained the tarry feces so characteristic of starvation. Besides these we noticed a few pups which appeared weak, as if starving.

At Glinka, on August 20, I saw a great number of decayed carcasses of young pups, probably a hundred or more, between Zapadni and Sabatcha Dira. These had apparently been dead a long time. There were no dead bodies of pups which had died within a few days, though I found a couple of comparatively recent date, which from their extreme leanness appeared to have starved to death. A few, but only a few, of the pups which we saw on shore appeared weak and thin, and only one was in a so far advanced state of starvation as to make its death within a few days a matter of certainty.

Hoping to have a chance to investigate the question of the mortality of the pups on North Rookery, Bering Island, during the time while the steamer was taking on board the skins, I returned to the islands during the latter part of September.

On September 27 I went ashore at that rookery in the first boat and at once proceeded to the rookery ground in order to lose no time, as the vessel was only going to stay a few hours. There were only a few hundred female seals ashore, and as it was low water these were chiefly located on the outer rocks and mostly on the eastern side of the reef. The weather was cloudy, with heavy squalls of a fresh southeaster, occasionally a light drizzling rain. Having received the oral permission of Mr. Grebnitski to go anywhere on the rookeries, I did not notify the kossak, who was at his house half a mile away.

I commenced to count the dead pups which I saw in the windrows around the "sands," starting from the southwestern end, distinguishing between those which had died within the last couple of weeks and those which were so utterly decayed as to indicate death at a very early period, probably shortly after birth. In the windrow around the "sands" I counted 429 comparatively fresh carcasses and 143 old ones; total, 572. The former were rather large black pups, with a large proportion of gray ones or gray in part. They showed every appearance of being starved to death. A few dying gray pups, lean and helplessly crawling about on their bellies, were seen, and only very few, scarcely more than half a dozen, perfectly fresh bodies. Two or three skeletons, perfectly fresh and pink, showed how the large gulls (*Larus glaucescens*) had disposed of some of the bodies, while the presence of a couple of blue foxes accounts for the others.

I have pointed out in my former reports that the foxes, so numerous on these islands, are accountable for the disappearance of a great number of dead pups from the beaches, and I may add here that our observations on the South Rookery make it appear probable that the number of the recently born dead pups eaten and carried away by the foxes is proportionately less than that of the starved pups, for several reasons: First, at the time of the births of the pups there is enough offal left on the killing grounds to make these more profitable to the foxes; second, the new-born dead pups are lying among the seals, and it is as much as a fox's life is worth to venture in among the harems. We saw repeatedly how the cows resented the intrusion of the foxes and chased them off, and it was only by constant watching that the fox was enabled to snatch a body away; and, thirdly, the young foxes were growing all the time, requiring more and more food, and finally themselves invading rookeries where there would be no difficulty in securing the starved pups later in the season.

Having finished the count around the "sands," I proceeded to count the bodies on and around the rocks at the water's edge and the higher portions of the "sands," when I was stopped by a guard sent by the overseer, the kossak Selivanof, with an order for me to leave the rookery on the pretense that "the wind was bad." In spite of the absurdity of the excuse, as I was on the lee side of the few hundred seals on the beach, I obeyed at once, having as a matter of necessity no other course open to me. Selivanof was in the village, and by the time I could see him and remonstrate it would be too late to begin the count again, as the steamer could not wait for me. The skins being nearly all in, I returned, therefore, to the ship.

Though consequently exact figures can not be furnished, it is nevertheless certain that there has been in 1897 a considerable mortality among the pups on North Rookery, Bering Island, due to starvation.

Statistics relative to the fur-seal catch on the Commander Islands, summer 1897.

BERING ISLAND DRIVES.

NORTH ROOKERY.

No. of drive.	Date (new style).	Locality.	Bachelors.	Cows.	Total.
	1897.				
1	July 12	Sivutchi Kamen	60		60
		Reef	186		186
2	July 37	Sivutchi Kamen	183		183
		Reef	775	4	779
3	July 28	do	189	2	191
4	Aug. 6	do	722	3	725
5	Aug 12	do	920	1	921
		Kishotchnaya	216	2	218
6	Aug. 21	Reef	519		519
		Kishotchnaya	181		181
7	Aug. 26	Sivutchi Kamen	118		118
		Reef	352	1	353
8	Sept. 7	Sivutchi Kamen	*a* 96		96
		Reef	*b* 223	1	224
		Kishotchnaya	*c* 119		119
		Total			4,873

a Of these 10 were stagey. *b* 23 stagey. *c* 17 stagey.

SOUTH ROOKERY.

No. of drive.	Date (new style).	Bachelors.
	1897.	
1	July 14	14
2	July 20	32
3	August 1	23
4	August 9	30
5	August 24	26
6	August 28	16
7	September 7	5
		151
	Two damaged skins	2
	Total	153

COPPER ISLAND DRIVES.

GLINKA.

No. of drive.	Date (new style).	Locality.	Over 20 pounds.	Under 7 pounds.	Full weight skins.	Total.
	1897.					
1	July 3	South end of island and other places		6	333	339
2	July 4	Sikatchinskaya		3	631	634
3	July 5	Babi Podiom		1	257	258
4	July 12	Urili Kamen, Pagani, Sabatchi Dira, Palata		212	1,071	1,283
5	July 18	Palata		3	63	66
6	July 25	Sabatchi Dira		22	*a* 344	366
7	July 27	Zapadni, Sabatchi Dira		19	*a* 554	573
8	July 28	Zapalata		8	449	557
9	July 30	Zapalata, Babi Podiom			321	321
10	Aug. 3	Zapadni, Urili		42	243	285
11	Aug. 9	Zapalata, Palata, Zapadni, Urili		13	208	221
12	Aug. 19	Palata		10	47	57
13	Aug. 20	Zapadni	1	6	64	71
14	Aug. 23	Babi Podiom		3	23	26
15	Aug. 26	Palata			19	19
		Total	1	348	4,627	4,976

a Including 1 cow.

KARABELNI.

No. of drive.	Date (new style).	Locality.	Under 7 pounds.	Full weight skins.	Total.
	1897.				
1	July 4	Stolp	4	260	264
2	July 6	do	5	122	127
3	July 13	do	14	285	299
4	July 20	do	1	112	113
5	July 26	do		58	58
6	Aug. 2	do	1	73	74
7	Aug. 4	do	2	73	a 76
8	Aug. 6	Bolshaya Bukhta		79	79
9	Aug. 10	Vodopad	12	187	199
10	Aug. 23	Stolp	1	19	20
		Total	40	1,288	1,329

a Including 1 cow.

SUMMARY OF COMMANDER ISLANDS AND ROBBEN ISLAND CATCH, SUMMER 1897.

Bering Island:			
North Rookery	4,873		
South Rookery	153		
Total		5,026	
Copper Island:			
Glinka rookeries	4,976		
Karabelni	1,329		
Caught in sea-otter nets	4		
Total		6,309	
Commander Islands, total			11,335
Robben Island			214
Grand total			11,549

As might have been expected, the catch was considerably smaller than that of the corresponding season of 1896, the Bering Island rookeries and Karabelni showing a great falling off. The slight increase of the Glinka catch is caused by an unusual activity on the part of the Government agents in killing seals by means of boats at places on the shore where no killing was formerly thought possible. It is quite characteristic that not a single seal was obtained at the old hauling grounds at Petshani, which formerly yielded the large majority of the skins. So desperate has the raking of these rookeries become that during the present summer the bachelors were culled from among the breeding cows in some places, as on Bering Island. Conditions seem to have been similar at Karabelni, as the chief hauling ground, Vodopad, yielded only 199 skins.

It will be noted that if the killing had been stopped on August 1 the total for the Commander Islands would only have been 6,633 skins. Nothing could better illustrate the straits to which these rookeries have come.

REMARKS UPON MR. G. E. H. BARRETT-HAMILTON'S "REPORT ON THE RUSSIAN SEAL ISLANDS IN THE NORTH PACIFIC, 1896, DATED MARCH 4, 1897."

Mr. G. E. H. Barrett-Hamilton's "Report on the Russian Seal Islands in the North Pacific, 1896, dated March 4, 1897," is to a large extent a criticism of certain portions of my "Russian Fur-Seal Islands," as I wrote it in 1895. It is therefore but natural that I should devote some space to a reply. A running comment and refutation of certain statements and arguments is impracticable on account of the way in which his criticisms are woven into the narrative of his own experience. I have therefore preferred to sift out those matters for which he takes me to task and to treat of them in a connected argument.

I may state right at the outset that the differences between us do not, as a rule, relate to facts. So far as I can see he admits that I have stated them correctly on the whole, and with regard to the facts observed and stated by him I can make a similar admission. I may state further that Mr. Barrett-Hamilton also, to a great extent, agrees with me in my conclusions. He does not blame the *driving* of the male seals for the decrease nor the early raiding of the rookeries; he admits that the females and bachelors go long distances to sea to feed during the summer; he thinks I am correct in assigning separate feeding grounds to the Bering Island seals (North Rookery) and the Copper Island seals; he seems to have no doubt that the pup must starve to death on the rookery when the mother is killed at sea; he even goes to the length of admitting that pelagic sealing is *partly* responsible for the decrease, while I have maintained that, as a general proposition, the immense injury to the Commander Islands seal herd is caused by pelagic sealing *alone*. However, by qualifying his admission by asserting his inability to fix the exact portion of the blame to be laid on pelagic sealing as the cause, he leaves a chance for those so disposed to assume that he considers this portion quite insignificant.

Here, then, is one point in which he professes to disagree with me. The other difference appears to relate to the mortality of the pups on Commander Islands. I shall treat of the two points separately.

It appears to Mr. Barrett-Hamilton (p. 31) that I have omitted "one of the most important causes, and one which has been thoroughly insisted upon by the British commissioners of 1891 and 1892 as being a most potent cause of the decrease of the seals," viz, "over-killing" of *males on land*, and he thinks that the opinion of these commissioners and of Mr. Venning "is at least worth quoting." In answer to this I may say, first, that Mr. Venning's report was never *published*, so far as I know, and that I have only got hold of a copy of it long after my own report was printed. Consequently I could not well quote Mr. Venning's opinion even if I had thought it worth quoting. As to the opinion of the British commissioners of 1891, it would have taken more space than was at my command were I to have quoted and refuted *all* the curious opinions held by them. The irrelevancy of the "overkilling" argument I regarded as so *obvious* as not to merit special notice, since nobody else, at the time I wrote, seemed to have taken it up seriously. I dealt with those causes which "have been *generally* regarded as responsible for the undeniable decline of seal life" (Russian Fur-Seal Islands, p. 134), and it seems to me altogether uncalled for when Mr. Barrett-Hamilton, after this limitation, declares that "a reader would conclude that *no other cause had ever been alleged* for the decrease of the seals."

As Mr. Barrett-Hamilton revives this theory, though now greatly tempered by the admission of overkilling at sea, it may be necessary to go into particulars, since he has based his argument partly upon facts and statistics furnished by myself in my book. But unfortunately he has so misread and misconstrued my statements (as in the above example) that part of my business must first be to set him and the "reader" right on these preliminary points. Mr. Barrett-Hamilton's mistakes are, I fancy, attributable to oversight, due to his anxiety to prove his own theory, as well as to carelessness in reading my book, and particularly in quoting it. The appearance of misrepresentation, however, is undoubtedly unintentional, as I am glad to admit, for

I know him to be incapable of willful misstatements. These points, then, must be cleared off before we discuss his criticism, because they sensibly affect the argument.

On page 14, after having asserted (erroneously) that "it was only in 1895 that the *whole* (North) rookery was first driven," in proof of which he offers Captain Pelly's "it is said,"[1] he adds in corroboration of my own statement, on page 57 of my book, "as well," namely, that this rookery "was never before raked and scraped for the last bachelor seals as it was during the past season" (1895). To this he adds, though without quotation marks, another alleged statement of mine, "*that* (p. 107) *although even before that year* (1895) *females and pups got unavoidably mixed up in the drives, the percentage was not very great*," leaving the impression that, say in 1894 or 1893 (i. e., *before that year*, 1895), the percentage of females and pups in the drives "was not very great." Now, this is exactly the opposite of the statement I made. I used no such expression on page 107, or elsewhere, as that Barrett-Hamilton attributes to me. On page 107 (the page he quotes) I said as follows: "It is a fact well worth mentioning that *even in those days* (i. e., 1882–83) females and pups got unavoidably mixed up in the drives. The percentage was not very great, *but great enough to be a distinct feature of the drives on this island*." He ought also have quoted my direct statement, on page 57, to the effect that "while it is true that the great rookery on Bering Island was never before 'raked and scraped,' for the last bachelor seals as it was during the past season (1895), yet it is not denied that a *similar difficulty* in gathering the requisite number of killables has been going on for a couple years, though not to the same extent." The mixing in of females and pups was therefore always *a distinct feature* of Bering Island drives even in the palmy days of 1882–83; of late years, after the killables became scarcer, the rookery was raked and scraped, the highest degree being reached in 1895, the year when my report was written. This is in perfect harmony with the other statement of mine that "here is a rookery where the females have been driven probably as long as seals have been taken, though not in the same proportion as now. Yet the females returned to be driven over and over again, and the *breeding ground* is the part of the rookery least affected in the general decrease."

Again: Barrett-Hamilton, in connection with the question of the scarcity of the yearlings in 1895 (about which considerably more later on), says (p. 14): "In fact it appears to me that in laying stress on the scarcity of yearlings on this (North) rookery Dr. Stejneger has somewhat missed the point. It would have, I think, been more correct to say that *all* males were scarce, but especially the younger ones." More correct, indeed! As if that was not the very thing I have said throughout my report. Have I not shown "the marked decrease of the killables (p. 134)?" Have I not emphasized the lower percentage of bulls on Bering Island? Have I not said expressly (p. 109) "the greater falling off in this rookery was due to the decrease in the number of *bachelors;* but instead of affecting all classes this diminution was *chiefly* confined *to the younger ones*?" What difference is there between my phrase "chiefly the younger ones" and Barrett-Hamilton's own "especially the younger males?"

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[1] Captain Pelly's remarks (p. 53) that in the seal drive witnessed at the northwest rookery Bering Island (1895), a practice was pursued which is said to be for *the first time* there and never elsewhere, viz, that "instead of only driving up the young males which used to congregate together, the whole crowd was driven up to the slaughter ground" rests, so far as the italicized words are concerned, on a misunderstanding, as I am in a position to know, since I was myself Captain Pelly's informant.

His further stricture is of a similar nature. To anybody who has read my book carefully it must be plain that when speaking of the decrease of the seal herd I have referred chiefly to the females. I was sent out to find out whether the breeding stock had been depleted, and to ascertain, if possible, the cause; that the bachelors had become scarce had been proven by the low figures of the land catch. I needed not to go to far-away Bering Island to report upon that in particular. The decrease of the cows was the only *serious* injury to the herd. It is also plain that when I said, in the general summary, alluding both to Bering and Copper islands (p. 135), that "*I have been unable to resist the force of the logic which places the blame for the decrease of the Commander Islands' seals upon pelagic sealing and upon pelagic sealing alone*," the remark criticised by Barrett Hamilton (p. 14), I did not specify the Bering Island bachelors, much less a single class or age. I did not even allude to the scarcity of the yearlings in the summary (p. 134), nor did I anywhere make it a point, nor try to explain it. I only reported the fact in its proper place. Yet Barrett-Hamilton goes on to say "It is difficult to understand how pelagic sealing is to be made accountable for the fact that of 29,112 seals driven to the sealing ground only 540 were yearlings;" and again, after having summarized my remarks "by stating that the whole rookery had decreased, but that the decrease manifested itself chiefly in the males, and especially in the younger males," he says "Now to lay the blame for the above peculiar condition of the rookery to the doors of pelagic sealing alone is illogical." In the first place, as a matter of fact, I have not laid the blame for this condition on pelagic sealing, much less on pelagic sealing *alone*. I was careful not to commit myself to any definite theory as to the scarcity of the males on Bering Island, a point to be gone more fully into where I shall be discussing Barrett-Hamilton's theory on this point, and consequently I did not lay the blame on *pelagic sealing alone*. But it does not seem to be so "very difficult to understand" how pelagic sealing could be made accountable for the practical absence of yearlings *if* we accept Barrett-Hamilton's idea that they did *not exist*. I wish to emphasize in the most positive manner that what I have shown was that the yearlings did not appear in any consequential number that year on Bering Island rookery, not that they had no existence at all! Now, what Barrett-Hamilton has such difficulty in understanding is this: *Because* the yearlings did not *exist* in 1895 they were either not born in 1894 or else they died that year after birth, and "whatever the cause of this may have been, pelagic sealing, at any rate, could have had nothing to do with it on the North Rookery, for we have Dr. Stejneger's own statement that the feeding ground of this rookery had not been seriously tapped by pelagic sealing up to 1895." Sounds good! But *suppose*, for an instant, that the damage which undeniably had happened to the Bering Island female seals was visited in 1894 on the pregnant females of that rookery off the coast of Japan during their migration north! *Suppose* that the pelagic sealers in *that year of unprecedented slaughter*, 1894, had fallen in with the herd of Bering Island cows particularly, would it be such a tremendous straining of the intellect to understand how pelagic sealing could be made accountable for "an unusually small birth rate in 1894!" The year 1893 was also terrible to the migrating pregnant female seals off Japan. Is it so difficult to understand how pelagic sealing could be made accountable *under Barrett-Hamilton's supposition* for the decrease of "especially the younger males" outside the yearling class of 1895?

Another instance of misquoting my words relates to the question of the mortality of the pups, and will be treated in connection with that matter.[1]

HAS OVERKILLING OF MALES ON LAND CONTRIBUTED TO THE DECLINE OF THE BREEDING HERD ON THE COMMANDER ISLANDS.

Mr. Barrett-Hamilton having resuscitated, at least in part, the theory that the present deplorable condition of the seal herd is due to overkilling of the immature male seals on land, it becomes necessary to examine into the reasons submitted by him for such an opinion. These reasons may be summed up briefly as follows: (1) The scarcity of bulls on Bering Island; (2) the practical absence of yearlings in 1895; (3) the alleged decrease of bachelors before 1892.

Scarcity of bulls on Bering Island.—It is first to be remembered that I have always spoken of the scarcity of bulls on North Rookery, Bering Island, as compared with the superabundance of bulls on Copper Island, and that I have never asserted that there were too few bulls. Of course, people who believed that an average of over 25 or 30 females to a bull is too great would naturally come to the conclusion that a dangerous condition existed on Bering Island. Now, when we know that each bull is able to fertilize an *average* of considerably over 100 females, there can be no further ground for apprehension or for a belief that the decrease of the seals on North Rookery is in any way due to a lack of sufficient male element.

Yet this relative scarcity of bulls had furnished Mr. Barrett-Hamilton with a double edged argument for the opinion that "overkilling" is at the bottom of the evil. According to him this lack of bulls in 1895, in the first place, is due to the killing of bachelors in former years to such an extent that none, or hardly any, escaped to grow up to maturity,[2] consequently "overkilling" is the cause of the decrease of the bulls. In the second place, this scarcity of bulls again resulted in nonfertilization of a great many females, consequently a low birth rate and decrease of the younger classes, more especially the yearlings in 1895. But he never attempts to explain the comparative abundance of the older bachelors on this rookery, viz, those in age next to the bulls, those furnishing the heavy skins in 1895. Where did they come from, in all this decrease of both their juniors and their seniors due to overkilling? This question he avoids, though he knows well enough that if overkilling ever took place it acted throughout all the years when these classes were born.

His explanation of the alleged decrease of the junior grades, particularly the yearlings in 1895, will be treated of in a separate chapter. Let us here look into the claim that the scarcity of the old bulls, whether injurious or not, is due to overkilling.

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[1] The following point is not very material, but it illustrates a general lack of scrupulous care in quoting. On page 12 Mr. Barrett-Hamilton says: "He (Stejneger) thinks (pp. 38 and 39) that in Steller's time either there were no seals at the North Rookery or that if there were Steller never visited that part of the island." This is a monstrous distortion of what I have said in my book, and also of what I think! On the contrary, I have said (p. 38) that Steller's omission of mentioning the North Rookery is corroborative evidence that he never visited personally that part of the island, or that if he did he traveled there when the island was covered with ice and snow, at which time, of course, there was no evidence of a seal rookery. I have never for a moment entertained such an extraordinary thought that "in Steller's time there were no seals at the North Rookery."

[2] Yet, as we shall see further on, he uses as an argument in another case the fact that the rookery was never scraped so clear of bachelors as it was in 1895.

It must be understood that the number of bulls on Bering Island, even in the days of plenty, never ran up into the thousands. They were only to be counted by hundreds. It is consequently plain that only a limited number of new bulls were required to counteract the annual falling off of superannuated or dead bulls, as well as the increased demand for more males due to the steady increase of the breeding females. It must also be understood that even in the worst years, meaning those in which the bachelors were most relentlessly pursued and killed, that even in these years there is a period in each during which no bachelors are taken, viz, when the skins are stagey. Very often, though not every year, a drive or two is made in October when the stagey season is over, but the very possibility of taking several hundred skins then is most conclusive evidence that, in spite of all scraping, there are more bachelors left. The very fact that large numbers of 4 and 5 year-olds appear next year, though the rookery was apparently cleaned of 3 and 4 year-olds shows that it is not possible to get all the seals which are near the rookery and probably hauling out at one time or another. It would be an impossibility to kill so close and so continually that not enough males would escape to fill the few gaps in the ranks of the bulls.

This conclusion is then reached, even under Barrett-Hamilton's supposition, that all the bachelors *existent* betake themselves to the rookeries and haul out. For the sake of disproving overkilling as a cause of lack of bulls it is therefore not necessary to take refuge in the theory that large bodies of male seals stay at sea from the rookeries. This side of the question I shall discuss more fully hereafter, and I wish only to call attention to the matter in this connection, because if we accept that explanation the overkilling theory becomes still more inadmissible and impossible.

The practical absence of yearlings on North Rookery, 1895.—Barrett-Hamilton in laying such stress upon the fact reported by me that in 1895 the yearlings were practically absent from Bering Island North Rookery seems only to have found one way in which to explain their nonappearance, viz, their nonexistence, and according to him this nonexistence can only be due to one of two causes—either to their not having come into existence at all in 1894, or to their having become exterminated. As he rightly considers sealing on the Bering Island *feeding grounds* in 1894 to have been too limited (he seems to think—erroneously—that it did not exist at all) to cause the starvation of practically all the pups in 1894, he falls back upon the only other alternative, and conjectures that they were not born at all. Upon this postulate he builds further and postulates that they were not born because their mothers had not become fertilized in 1893, and this lack of fertilization, it is further postulated, is due to "overkilling" of males at some earlier period. He thus draws the imaginary conclusions backward apparently logically enough, but does he draw them forward as well? Does he also draw the necessary consequences? If in 1895 there did not exist any yearlings to speak of, there could be no 2-year-olds in 1896. In my report upon my visit to the islands in 1896 (ante p. 159) I have given the weights of the skins, however, and it is from the figures there submitted perfectly clear that there was no relative deficiency of the class in question. In 1897, according to Barrett-Hamilton's theory, there ought to be an almost absolute absence of 3-year-olds, but although the figures of the weights have not been forthcoming yet, it can be stated with certainty that there was no such absence.

The explanation is, of course, obvious. The yearlings of 1895, for some unknown reason, did not turn up in the usual number, or, I should rather say, gradually decreasing number due to the decimation of the pregnant mothers each year off Japan. Having also shown that there is no good reason for believing that the birth rate was abnormally small in 1894, caused by lack of fertilization in 1893, I think it is safe now to conclude that overkilling on land had nothing whatever to do with the absence—temporary absence—of the class of yearlings in 1895.

It may be well, however, to speak in this connection of another theory of Barrett-Hamilton's bearing upon the same subject and which at a first glance looks plausible to the extent that one might suspect that "there may be something in it." I refer to his insisting that the late serving of the females by the few bulls begets late pups and consequently pups of less resistance and a resultant higher death rate of the yearlings. Yet he says in another connection (p. 44): "One of the most striking things on the seal islands is the great difference between the ages of the pups, and to the very last day on which I was on the *Pribilof Islands* (October 22) there were with the large, fat pups *any number* of quite small ones, which could certainly not have an equal chance of surviving the winter as the larger ones * * *." Now, Mr. Barrett-Hamilton will probably not insist that there were not *enough* bulls on the Pribilofs to serve "any number" of the females present at the first heat? And if there are "any number" of late pups on the Pribilofs which are not due to lack of bulls, why conjecture that the late *black* pups seen by me starved to death not later than the first week of September are the results of late fertilization, due to an alleged lack of bulls, due again to an alleged previous overkilling of bachelors? Of course, late fertilization would mean late pups, and late pups probably means less resistance for them during the winter migration, but it is clear from Barrett-Hamilton's own observation, quoted above, that such is the normal condition, even where bulls are plentiful, and no anomaly due to "overkilling."

The alleged decrease of bachelors before 1892.—The decrease in the catch of bachelors in 1891 does not prove anything with regard to the status of the breeding herd. As Dr. Jordan has shown, it would be quite possible for the breeding herd to be actually increasing while the catch of bachelors was decreasing. It must be remembered that during the time of plenty the killing of the bachelors was practically over by August 1, and that skins under 8 pounds were rejected. Now *suppose* that, for some reason or other, the time for killing was extended and the minimum weight lowered to 6 pounds. It is obvious that in this way the catch could be materially increased for a couple of years, but it is also clear, that if the average catch fairly represented the capacity of the herd under the former arrangement the catch must of necessity decline shortly after, if the breeding herd does not increase *correspondingly*. It may yet continue to increase, but if the increase is not commensurate with the extension of the conditions of the catch, the latter must decrease in spite of the increase of the breeding herd until the catch reaches the level of the increase where it again becomes stationary or slowly increasing. Now, that is precisely what took place before and during 1890, and the result was the drop in 1891. But if 1892 had not seen the beginning of the pelagic sealing in Asiatic waters, the catch would have remained stationary at that level and shortly afterwards begun to increase, as the breeding herd would have been unimpaired and consequently increasing. No serious injury would have ensued. The company leasing the islands from having lowered the standard during the years immediately preceding 1890 would have to suffer a setback for some years as they had *anticipated* the catch, but the breeding herd would go on increasing just the same.

This then was not "overkilling," properly speaking; it was only "anticipation," and was chiefly the business of the company.[1] Pelagic sealing, however, just then commenced on the Asiatic side and made such inroads both in the breeding seals and the bachelors, that the rookeries shrunk visibly and the catches on land fell off with unexampled rapidity year after year.[2] It is therefore neither unjust nor incorrect to lay the blame on the pelagic sealing for the *continuous decrease* of the bachelor seals *on pelagic sealing alone.*

Barrett-Hamilton (p. 35), "without wishing to throw any doubt" upon my statement that the lower figures of the catch for 1876, 1877, and 1883, the "years of rest," as he calls them, were not due to a lack of seals on the rookeries, but to the fact that the company did not desire more on account of the conjunctures on the market, nevertheless calls attention to the coincidence of certain remarks by Bryan and McIntyre, and lays stress upon the fact that the administration of the affairs of the lessees both on the Pribilofs and the Commander Islands was in the same hands. This very fact ought to have convinced him that it was the status of the market which actuated the company, as, otherwise, if they had wanted "years of rest," they would undoubtedly have had them alternate on the two groups of islands. Barrett-Hamilton has not only overlooked that I was on the islands in 1883 and consequently know from personal experience whereof I spoke when I asserted that the lower catch was not due to a decrease of the killable seals, but he has also lost sight of the fact that the smaller catch was publicly announced to the market the year previous. But the whole argument from these so-called "years of rest" falls entirely to the ground when we remember that Barrett-Hamilton restricts (in his mind) the increase of the Commander Island rookeries to the years 1870 to 1880 (p. 34), for, accordingly, it was necessary to give two "years of rest" during this period of increase, and only one "year of rest" during 1881 to 1890, the "period during which there was practically no increase of the seals (p. 34)." This surmise of Barrett-Hamilton's of an increase only from 1870 to 1880 and a stationary condition between 1881 and 1890 is entirely devoid of any basis in fact and is contradictory to all the evidence at hand, for my observations were made during this alleged second period, and at that time the seals, as a whole, were certainly increasing.

Over-killing on Copper Island?—After having himself described the character of the rookeries on Copper Island and the impossibility of catching as large a proportion of the bachelors hauling out as on Bering Island; and after having himself used this as an argument for the superabundance of bulls on the Copper Island rookeries,[3] Barrett-Hamilton thinks, nevertheless, that "over-killing" must have had something to do with the decrease on Copper Island. Of course, he could not avoid the logic of the following question: Seeing that the decrease has been even larger on Copper Island, and seeing that the damage has been even worse, how is it possible to blame "over-killing" for the decline of Bering Island, if it can not also be shown to be responsible on Copper Island? And so he lit upon a passage in my book (p. 117) in which I say that in 1890 "some active work" had to be done on Copper Island because bachelors were *somewhat scarce*, though I added that the falling off could not have been excessive, as the quantity of skins that year on Copper Island was the largest ever shipped from that island. What actually took place was that the company—the outgoing one—*anticipated* some of next year's catch, to the detriment of the incoming company, no doubt, but to no detriment whatever of the breeding herd.

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[1] Whether such an arrangement was unprofitable or the reverse would naturally depend on the conditions of the fur market. If the prices were particularly high, it might be profitable to "anticipate," especially since the resultant decrease later on would tend to send the prices still higher.

[2] It is quite possible, moreover, that the drop in the catch of 1891 would not have been so large, if it had not just happened that the business was that year transferred to a new company.

[3] "I can *only* attribute the number of old bulls to the difficulty here in obtaining every seal and scraping the rookeries clean" (p. 29). It would seem more natural to attribute the superabundance of bulls to the excessive decrease of the females, which can only be *due to pelagic sealing.*

One must, indeed, be infatuated with the theory of "over-killing" to even suggest that it could be practiced on Copper Island to such an extent as to cripple the breeding herd and thus contribute to the decadence of the rookeries. The very fact, therefore, that the Copper Island rookeries have been the greatest sufferers up to 1895 is corroborative evidence of the highest importance in disproving the theory with regard to the Bering Island rookeries.

Over-killing of bachelors on Robben Island?—Barrett-Hamilton's zeal to show "over-killing" of bachelors to be one of the principal causes of the decline of the seals has led him into a curiously self-contradictory argument concerning the status of the seal rookery on Robben Island.

On page 6 he devotes a whole chapter to a suspected case of a thousand females on Robben Island in 1891, "which had either not been impregnated in the previous year or were barren."[1] Finding the latter alternative improbable he accepts the former. He continues: "If that were true in 1891 (as the rate of killing since that date, except in the following year, when no seals were killed, has been pretty high, reaching 1,500, 1,000, and 1,300 in 1893, 1894, and 1895, respectively) it would well account for the present small size of the herd, and it is evident that another *period of total cessation of killing on the island is badly needed.*" He goes so far as to find corroboration of this state of affairs in the statement by Captain Grœnberg, that in 1895 the weight of the skins taken was good and yearlings were scarce, concluding that it "probably means that few pups were born in the previous year." It will be noted that the conditions thus reported by Captain Grœnberg were identical with the status on North Rookery, Bering Island, during the same year, and that Barrett-Hamilton's explanation is the same, viz, non-birth of pups the previous year on account of lack of impregnation of the females. But—and this is the fatal point—on page 4 of his report he states that it is difficult to cut off and drive all the bachelors on Robben Island, and that "it is probably owing to this circumstance that the number of bulls here is as great as it is" (viz, about 30 bulls to 450 females on shore, liberally estimated by Barrett-Hamilton himself, though further on he insinuates that there was probably a greater disproportion between the sexes, p. 3).[2] Now, with a proportion of one bull to 15 cows on shore or, say, as a maximum, one bull to 30 cows altogether, Barrett-Hamilton can not possibly lay any failure of impregnation of the females to the lack of bulls, and if he can not do that he can not trace the decrease to over-killing, which means the killing of so many males that there are not enough left for impregnation purposes, and if he can not do that it is utterly senseless to recommend "another period of total cessation of killing on the island."

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[1] But why not virgin?—L. S.

[2] When Prof. d'Arcy Thompson visited Robben Island at the height of the season, 1897, he counted 78 bulls. Evidently the "over-killing"-of-bachelors theory will not do at all for this rookery.

Nothing could better illustrate the fallacy of this alleged "over-killing" theory. The Robben Island herd has decreased because raiders and others have killed females as well as males during the summer, while during the winter the pelagic sealers off Japan have done likewise. On Bering Island the herd has also decreased because the females have been killed, in this case, however, by pelagic sealing both in summer and winter.

Fluctuations in the land catch.—The fluctuations noted in the land catch from year to year are due to many causes—as, for instance, less abundance of killables near the islands, unfavorable weather for the catch, epidemic diseases among the natives, as has happened at least one year, anticipation of the catch during a previous year, etc. The increase or decrease of the catch therefore does not denote a corresponding decrease of the breeding herd, unless the change is notable and gradual (eliminating the accidental fluctuations) over a long period.

The essential part of the seal question has been, and is, the question concerning the decrease of the breeding seals and the causes which brought it about. I did and do still maintain that such a decrease has taken place and, moreover, that *for this the pelagic sealing is to blame and the pelagic sealing alone.* Nothing that Mr. Barrett-Hamilton has brought forward has shaken this conclusion, and the utter groundlessness of the theory of over-killing is excuse enough for my having ignored discussing it in the original edition of the "Russian Fur Seal Islands."

Fallacy of the principles upon which the theory of over-killing is based.—The fundamental, and consequently fatal, fault of Barrett-Hamilton's theory of over-killing of males on land being even a contributing factor to the decrease of the breeding-herd, consists in the fallacy of two of his essential premises, viz, first, the proper number of bulls necessary to the impregnation of the females, which he places at 30 (p. 43); and, second, the notion that all male seals go ashore on the rookeries every year.

The first point has already been disposed of above (pp. 88 and 168). The other may need to be elaborated still further.

It is curious that Barrett-Hamilton, who has devoted so much space in his report to what I have said concerning the Commander Islands seals and rookeries, passes by in profound silence an entire chapter which I headed "*Do all bachelors haul out?*" (p. 67). True, I did not point out the moral of the negative answer, but if I did not it was because I thought it obvious without. As a matter of fact, when I cast about for a cause that would explain the comparative scarceness of bulls on Bering Island I at once lit upon "over-killing," but it did not take me long to abandon it when I contemplated how unfounded it is to suppose that all, or nearly all, bachelors haul out every year.

That Barrett Hamilton believes that practically every individual bachelor, including the yearlings, get out upon the beaches every year is plain from numerous passages in his report, and his entire discussion of the absence of the yearlings in 1895 would be meaningless were he of a different opinion.

He visited the islands in 1896 and again in 1897, and I will modify the question which I put in a general way on page 68 of my book so as to cover these years, as follows: At the close of the sealing season of 1896, and having witnessed the "scraping" of the rookery on Bering Island ("the bachelors * * * are killed off to the last one," Barrett-Hamilton's own words, p. 12), do you believe that there were, say, 10,000 bachelors within sight or within a short distance? Do you believe that in 1896 10,000 bachelors more hauled up, either during the killing season or later? I can not be in doubt about the answer. But then if they were *not there nor elsewhere at sea*, whence then came the 5,000 bachelors killed on that same rookery in 1897, and the other 5,000 which probably perished during the migrations from natural causes, and from the shot of the pelagic sealers? And, moreover, if all, or nearly all, of all classes hauled out every year and they were "killed off to the last one" (except, of course, the yearlings), how could there then be any 3-year-olds and 4-year-olds at all on the rookery all these years when "over-killing" is alleged to have taken place? And yet the Bering Island skins have been particularly heavy of late years. Is there any other conclusion possible than the one I have drawn, viz, that only a fraction of the bachelors haul out? But if this question is answered in the affirmative what then becomes of the theory of over-killing? Clearly, no matter how closely the bachelors are killed on land, there is always a reserve at sea quite sufficient to recruit the ranks of the few bulls which annually retire from service, a number which even Barrett-Hamilton himself admits is insignificant (Rep., pp. 35-36).

Summary.—It may be useful finally to concentrate the above arguments into a brief summary.

The more or less sudden decrease in the yield of bachelors killed on land is no indication of any decrease of the capacity of the rookeries, and a decrease of females is so far from being necessarily concomitant with the decrease of the bachelors that the breeding herd may actually be increasing even some time after the bachelors show a decrease. In the specific case of the Commander Islands there is absolutely no ground for the assertion that the decrease in the catch of bachelors in 1890 on Bering Island, and in 1891 on Copper Island, "means a decrease of the whole herd also."

There is no indication that over-killing is responsible for certain conditions on Bering Island North Rookery. The absence of yearlings in 1895 did not mean their nonbirth, nor their destruction that year after birth. The comparative scarcity of bulls on that rookery can not be explained by over-killing. Even if the "last seal" that hauled out were killed each year (which they are not, the phrase only applying to the killing season), there would be enough bachelors in the sea to supply the necessary few bulls. There is nothing to substantiate any postulate that the bulls on North Rookery have not been sufficient in number to impregnate all the females, and over-killing, therefore, even if it had taken place, can not be charged with the decadence of the rookeries.

The theory of over-killing having thus been found inefficient to explain the decadence of the rookeries, I have to fall back upon my former conclusion, viz, that the blame for it rests "*upon pelagic sealing and upon pelagic sealing alone.*"

Mortality of Pups on the Commander Islands.

When I wrote my "Russian Fur-Seal Islands" in 1895, it was not yet admitted by the British side of the fur-seal controversy that the pelagic killing of the cow on the feeding grounds meant the inevitable death of her pup on the rookery. Consequently my calling attention to the fact of starving pups on the Commander

Islands was a potent argument in establishing this truth, which, at this writing, probably no one denies. In one respect, therefore, the whole question of the mortality of the Commander Island pups is no longer of any special importance, since nobody would have the hardihood to assert that the pups starve from this cause on the Pribilofs but survive on the Commanders. Even when Barrett-Hamilton wrote his report, he and all the other "experts" had become convinced of this. It would therefore seem superfluous for Mr. Barrett-Hamilton to devote nearly five folio pages (pp. 38–42) to "the dead-pup question" in the manner he has treated it, for it would not matter whether I in 1895, or Dr. Jordan and Professor Thompson in 1896, had all been mistaken in the dead pups we saw. If we had records of none, but only knew that a certain number of females had been killed by the pelagic sealers on the feeding grounds, we would now know that an equal number of pups had died on the Commander Island rookeries, and all we could do would be to seek for the causes of our not finding the requisite number of carcasses on the beaches.[1]

These causes, in all likelihood, would be found to be the same which I have already advanced in explanation of the fact that we have only been able to account for a minor fraction of these carcasses, viz, the nature of the beaches, the numerous presence of foxes, gulls, ravens, insects, etc. Barrett-Hamilton knowing these things when he wrote, in 1897, might have let the matter rest there. Yet he must needs dissent from my suggestion that the mortality of starving pups on Bering Island in 1895 was "*abnormal.*" As he supports this dissension by arguments based wholly upon erroneous reading of my report, and as his result, consequently, also is erroneous, I may be permitted to make some remarks.

With regard to the dead pups seen by me in 1895, Mr. Barrett-Hamilton starts out from the supposition that the figures I submitted refer to the whole North Rookery. On page 40 he says: "I do not propose to question Dr. Stejneger's figures for the North Rookery, but they should be about halved before they will stand as correct for the losses due to starvation, whether that starvation was due to pelagic sealing or to other causes, so that we may say that about 1,000 pups met their death from starvation, due to all causes combined, on the rookery in 1895." And again, on the same page, he says that "he (Stejneger) gives the following estimate of the number of dead pups on the rookery." As a matter of fact, I did not pretend to give any estimate for the entire rookery. The pups counted and estimated were those lying in the windrows on both sides of the sands and on the high ground. I made no attempt at estimating the number of the many carcasses scattered over the rest of the rookery, nor did I make any allowance for the numerous bodies which must have been destroyed by the foxes, etc., as I would have done had I attempted to make an estimate of the total number of dead pups on North Rookery in 1895.

It may also be pertinent to ask why Barrett-Hamilton asserts with such positiveness that my figures "should be about halved before they will stand as correct for the losses due to starvation?" The only explanation I can see is that, inasmuch as such a proportion was found that year on St. Paul Island between the pups dying shortly after birth and those starved to death later, it must also of necessity hold for Bering Island North Rookery. If so, his conclusion is based on singularly unfortunate premises, as the great number of early dead pups on the Pribilofs is supposed to be due partly to the presence of an excessive number of fighting bulls and partly to a dangerous intestinal worm, numerous on the sandy beaches. On Bering Island, quite on the contrary, both Barrett-Hamilton and myself have found the bulls to be comparatively scarce, at least to the extent that no fighting was going on that could cause an excessive mortality, while the nature of the beaches is such that there is not much chance for extensive ravages by the worm. But my own experience on North Rookery, in 1895, as printed in my report, furnishes a much better clue to the proportion on that rookery between the natural mortality befalling the newborn pups and the later mortality due to starvation. It will be noticed that (in 1895, the year before the discovery on the Pribilofs of the two classes of dead pups) I carefully distinguished between *two distinct classes of carcasses*, the old decayed ones and the comparatively fresh ones, and that I counted about 150 of the former to 200 of the latter. It matters not that at that time I did not clearly understand the causes of this difference; the important fact remains that I noted it. But the proportion between these two figures does not express the proportion between the number of pups that actually died during the two periods of mortality. During the first period, shortly after the pups are born, the foxes are not only less numerous, but the seals do not suffer them to enter the denser portion of the rookery at that early date, and consequently the carcasses of this class are left on the beaches to a much greater extent. In August the young foxes have grown sufficiently to go on the rookery, and the starving pups straying away from the breeding females become an easy prey to the marauders. It is no use guessing at figures, but it is safe to say that the number of starved pups on Bering Island in 1895 was several times larger than that of the newborn dead pups.

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[1] Barrett-Hamilton acknowledges almost as much, for he says (p. 41): "I think that there can be no doubt whatever that the phenomena of dead and dying pups as seen at the Pribilof Islands late in the season is also to be found on the Commander Islands, though to what extent I can not say." To this it may be remarked, first, that if the Canadian authorities would make public the sealing logs the *extent* of the mortality could be ascertained to a nicety; and, second, that the starving season on the Commander Islands begins much earlier than on the Pribilofs, there being no time limit restricting the beginning of pelagic sealing to August 1.

But Barrett-Hamilton, not satisfied with having in his opinion thus reduced the starved pups recorded by me in 1895 to an insignificant figure, which he thinks is probably "normal," next undertakes to show by my own book that "the 'abnormal' mortality of pups which he (Stejneger) reports from the North Rookery of Bering Island for 1895 was due entirely to the fact that two schooners between them made a catch of 245 skins, of which it must be remembered that 36, having been caught only fifteen days before Dr. Stejneger's visit to the rookery, must probably be subtracted." * * * Yes, if these were the facts, or if I had stated such to be the facts, I would certainly have been reduced *ad absurdum!* Of course I never made such statements, and Barrett-Hamilton would not have made it appear so had he been careful in reading and quoting me. Here is what he says (p. 41): "With regard to the pelagic catch in the neighborhood of the islands in 1895, the total number of skins taken by both the Canadian and the American fleet is given by Dr. Stejneger as 7,684, and, as far as I can make out, he *can*[1] only state of that number 245 were killed on the feeding grounds of the North Rookery (pp. 128 and 129), being the catches of the schooners *Jane Grey* and *Etta*. * * * In the *logs of the other schooners as given by Dr. Stejneger*[1] I can see no entry that any seals had been caught north of the islands." To properly appreciate this astonishing misinformation, let it be remembered that the overwhelming portion of the 7,684 skins, viz, 6,605, were taken by British schooners, and that it has not been possible to get from the proper authorities any extracts of the logs of these schooners. Let it next be remembered what I actually wrote (p. 128): "It has been long known that seals occurred in summer in the waters northwest of Bering Island, from Cape Kamchatka to Karaginski Island, but it seems as if in 1895 the sealers repaired there *systematically and with success.* I am indebted to Mr. C. H. Townsend for this information and for the following abstracts of the logs of the schooners *Ida Etta*, and *Jane Grey*." Not another word did I say; yet Barrett-Hamilton "can make out" that I can only state that of 7,684 seals 245 were killed on the feeding grounds of North Rookery, by which casuistry he makes it appear that out of 7,684 only 245 were actually taken there! Had he examined the British logs, which he could have access to, while they were closed to me, he would have found the exact number. But this is not the worst: "In the logs of *the other schooners*, as given by Dr. Stejneger, *I can see no entry*[1] that any seals had been caught north of the islands." Everybody must think, of course, that I have given more logs from 1895 than the two just quoted (not to say all, as his words really imply), but, as a matter of fact, I have not. *All the other logs given by me are from 1892!* And as if that were not enough, two of these *other* logs actually have entries showing over 200 seals to have been "caught north of the islands," not in 1895, it is true, but in 1892!

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[1] Italicized by me. L. S.

I think I have proven pretty conclusively that so far as the mortality of the pups on Bering Island in 1895 is concerned I am not the one who is reduced *ad absurdum.*

The facts are, as I have stated, that in 1895, for the first time, the Bering Island feeding grounds were invaded by the pelagic sealers *systematically and with success.* When the British logs shall have become published, it will be found that a large number of seals were taken in 1895 to the north of Bering Island on a scale quite commensurate with the number of starving pups on the North Rookery.

There is only one more point to refer to, viz, Barrett-Hamilton's remark in sequence of the above to the following effect (p. 41). "Nor does Dr. Stejneger's supposition explain the fact that a very similar mortality was noticed by Mr. Venning in 1893, in which year, he (Stejneger) states, 'the extension of the hunt to the Bering Island feeding grounds' (p. 135) had not taken place." Again a casuistic quotation of my words, which simply mentioned "the extension of the hunt to the Bering Island feeding grounds" without in the least stating that no hunt took place there in 1893. Barrett-Hamilton's version leaves the impression as if I had even denied that any seals had ever been taken north of Bering Island prior to 1895, while all I have asserted was that in the latter year the hunt for the first time was made *systematically and with success.* As a matter of fact, on the first map of my book, as well as on page 87, have I shown that seals were taken to the northward of Bering Island as early as 1892. With the few logs at my disposal, viz, 9 out of 40, showing more than 200 seals caught, it is safe to say that the actual total was much larger, and there is no doubt that, in 1893, there were killed on the Bering Island feeding grounds more than enough to account for the 150 *starved* pups found by Mr. Venning in that year on North Rookery.

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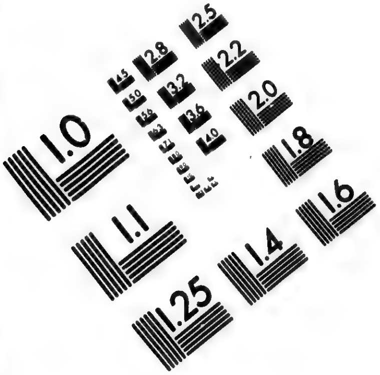
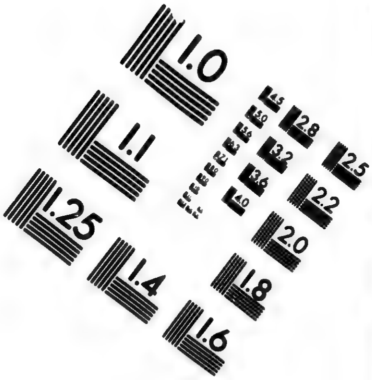
[1] Italicized by me. L. S.





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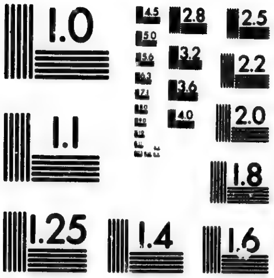

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RAIDING OF COMMANDER ISLANDS ROOKERIES.

The rookeries of Bering and Copper islands have always been a sore temptation to marauding schooners, especially those of the latter island, where, in addition to the fur-seals, there was a fair chance of obtaining a number of the costly sea otters, a few of which would go a long way to pay for the expenses and risks of such an expedition. The material is not at hand for an exhaustive list of all the attempted and accomplished raids on the Commander Islands rookeries, but I shall give a sufficiently detailed account to show that considerable damage has been done by the pirates.

Leaving out of consideration the possible raids during the flourishing times of the whale fishery in the forties, and coming down to recent days, we find that at first the raiders were attracted to Copper Island by their knowledge of the plentiful occurrence of the sea otter on that island, a knowledge gained by many of them during their visits to the islands during the "interregnum." We thus find the American schooner *Three Sisters*, Captain Herendeen, caught on July 22, 1879, at anchor off the Northwest Cape of Copper Island, the mate and sailors camping ashore near the sea otter rookery. Twenty-nine skins of grown sea otters and 16 sea otter pups were taken from her, but also 123 fur-seals, which it was claimed, however, were taken at sea. Instead of seizing the vessel, the authorities let her go with a warning. The seal skins found on her proved that sea otter was not the only game looked for, and in the same year, on August 10, an unknown schooner, off Glinka, attempted to land three boats, but the natives frightened them off.

The year 1880 saw an increased activity on the part of the poachers, who were much emboldened by their successes in the Okhotsk Sea. As early as July 7 the *Three Sisters*, of San Francisco, Captain Beckwith, was seen at anchor off Glinka rookeries, killing seals; the crew was driven off by the natives shooting at them. Mr. E. P. Miner (Brit. Counter Case, App., p. 113; Fur Seal Arb., VIII, p. 700) gives the following graphic account of this raid:

> She was chartered by H. Liebes & Co., and was supposed to be going out on a sea-otter and fur-seal hunting expedition, but as a matter of fact all of us who shipped as hunters knew that the vessel had been fitted out for a raid on the rookeries on the Commander Islands. Early in July we started from the Alaskan Coast for the Commander Islands, and about the middle of the month landed on the west side of Copper Island. We landed in the daytime in a fog. There were three boats. We had killed about 800 seals before we were seen, but had taken none of them on board the vessel. A baidarka with natives in it came along then, and we knew that warning would be given to the people on the island, and we began skinning the seals. In about an hour what appeared to be fifty men came across the island to where we were, and began firing at us with blank cartridges. We started off at once, but when some distance from land began killing seals in the kelp. Then they fired on us with bullets, and we went on the schooner. All the skins we got of the seals we killed was 153. Before we made the raid on the seal rookery we had anchored at the north end of Copper Island, where sea otters were plentiful, and while there a baidarka full of natives came out to us and served a warning on the captain, telling him that he must not hunt within 5 miles of the islands—the miles were, I suppose, meant for Russian miles. We went from Copper Island to the Kuril Islands to look for sea otter, and after getting one sailed on the 4th August for San Francisco.

On July 13, 1880, a schooner was reported at anchor close to the beach of North Rookery, Bering Island, and being discovered had probably but poor success. Not so, however, with the schooner that raided the Glinka rookeries about two weeks later, killing "a number of seals, say about 400." This can hardly have been the *Otsego*, Captain Isaackson, flying the Dutch flag, which was boarded on August 6 by the steamer *Aleksander II* at Glinka, but was found to have "4 to 5 fur seals only." On the next day Mr. Grebnitski boarded the schooner *Alexander*, Captain Littlejohn. The latter swore that he had shot the 53 seals found on board, denying that he had been near a rookery, and was warned off. Captain Sandman, on August 12, confiscated 4 sea otters from the schooner *Flying Mist*, Captain Bradford, which was found at anchor "around the Northwest Cape (Copper Island) close inshore about 8′ SE. from rocks," but with "apparently no seals."

On September 1 the kossak and a watchman boarded the schooner *Seventy Six*, Captain Potts, off the Southeast Cape, Copper Island, finding only one man on board, the rest being on shore. The watchmen went after them, but the schooner's crew made directly for the vessel as soon as they saw them coming and got away. "On shore the watchman found about 40 seal carcasses which the schooner's people had killed and skinned—all bulls."

The raiders did not confine themselves to Copper Island by any means, for on September 10 an unknown schooner visited the South Rookery on Bering Island, killing about 25 seals, and two days later a schooner, possibly the same, was reported "on the north side shooting seals at sea," but left on the approach of the steamer *Aleksander II*. After the departure of the latter, the schooner came in again on September 13, but the whaleboat which was sent ashore was driven away, by the natives firing at the crew, before any seals were killed.

Captain Littlejohn, in the schooner *Alexander*, evidently took no heed of the warning given him, for, on October 16, he was on the Glinka rookeries and took "some seals again," an exploit which he repeated on the moonlight night of the 18th, when he secured "a number of seals (mostly cows) before morning."

Although the record for 1881 is not quite so black, it is in some respects fully as interesting.

On Bering Island two schooners appeared at the North Rookery on October 8 and landed 6 whaleboats, killing many seals, mostly females and young ones. Mr. Grebnitski himself went to the rookery, but the shooner had already left. Exactly a week later two schooners again arrived off the north rookery, possibly the same, landing 5 whaleboats early in the morning of October 16. This time, however, the natives were prepared, and 40 of them, well armed with rifles, met the raiders. The latter now opened negotiations, the captain offering a gold watch to the chief, money to the men, and whisky to all for the privilege of taking 300 fur seals. The natives refused, and the raiders, after having examined some of the Berdan breech-loading rifles and having received an affirmative answer to their question whether the natives would shoot if they should attempt to kill any seals, withdrew. "Seeing that they could do nothing, they put to sea."

It is probably to a raid in 1881 that Mr. S. L. Beckwith's testimony relates (Fur Seal Arb., VIII, p. 810), in which he states that as "a mate on the vessel *Alexander*, belonging to Hermann Liebes, of which Captain Carlson was master," "in 1880, or thereabouts," he "went ashore and raided Copper Island, and got about 100 seals, and we would have got a great many more, for we had about 1,200 killed when we were fired upon. A Japanese vessel was there the day before raiding, and several of the raiders were shot." This last information seems to tally with the following record from Bering Island: "October 11. A schooner has been at Staraya Gavan. Buried one Japanese."

The fact was that the natives, incensed by the numerous raids, were using their guns freely during 1881. Thus, earlier in the season the *Annie Cashman*, of San Francisco, went to Copper Island, and Mr. E. P. Miner states (Fur Seal Arb., VIII, p. 701):

> We landed there one clear day, and in one and a half hours took 250 seals, and had them all on board before the natives came to where we were. We went away then, but came back the next night. We were fired on by the natives, and did not land.

It went particular hard with the British schooner *Diana*, Captain Petersen, sailing from Yokohama earlier in the season. She had been raiding various rookeries and finally went to Copper Island, where she came to grief. She anchored off Zapalata and a boat was immediately sent ashore. They did not reach it, however, for behind the rocks a large band of natives, under command of the kossak, Nikolai Selivanof, were lying in wait. When the boat was well within range, the kossak gave the signal and a complete rain of bullets struck the unfortunate boat. One man was killed, one severely wounded, and the boat, nearly sinking, made the schooner with the greatest difficulty. It is said that fully 300 shots were fired by the natives. The *Diana*, now severely crippled, sought safety in flight, but on the way to Petropaulski unfortunately fell in with a Russian man-of-war—the *Strelok*, if I remember rightly. The suspicion of the commander was aroused, an investigation made, which resulted in the imprisonment of the crew and the confiscation of the vessel with a cargo of about 570 skins, which Captain Snow states were taken on Bering Island, in spite of the plea of the captain that no raid was intended and that the boat was sent ashore only to take water, of which the schooner was short.

The case was made the subject of diplomatic correspondence between Great Britain and Russia, and the latter power sent a revisor to Copper Island in 1882 to investigate the matter. His report was favorable to the natives, no doubt, for the Russian Government, in recognition of their meritorious conduct, invested the native chief of Copper Island with a silver-laced kaftan, while Selivanof was promoted to be a sergeant and a beautiful Toledo blade was presented to him upon which was engraved a suitable inscription commemorative of the occasion.

It was plain that something would have to be done to check this growing evil, which had already been assuming alarming proportions, but the authorities were puzzled how to proceed effectively. One or two large war vessels were already patrolling the region, but their service was very ineffective, as they did not take the risk of going close under the foggy and dangerous coasts of the islands. It was thought, however, that strict regulations for the whole traffic of trading and hunting in Russian waters, which would leave the schooners no excuses or tecnical loop holes, would deter the marauders, especially in view of the past experience, and seeing that the Russian Government was in earnest in backing up the natives in their defense of the rookeries. A proclamation was therefore prepared and issued, first by the Russian consul at Yokohama and afterwards also by the Russian consul in San Francisco, the publication being specifically authorized by the Imperial Russian Ministry of Foreign Affairs. The consular warning was as follows:

> NOTICE.
>
> At the request of the local authorities of Bering and other islands, the undersigned hereby notifies that the Russian Imperial Government publishes, for general knowledge, the following:

1. Without a special permit or license from the Governor-General of Eastern Siberia, foreign vessels are not allowed to carry on trading, hunting, fishing, etc., on the Russian coast or islands in the Okhotsk and Bering Seas or on the northeastern coast of Asia, or within their sea-boundary line.

2. For such permits or licenses foreign vessels should apply to Vladivostok, exclusively.

3. In the port of Petropaulovsk, though being the only port of entry in Kamtchatka, such permits or licenses shall not be issued.

4. No permits or licenses whatever shall be issued for hunting, fishing, or trading at or on the Commodore or Robben islands.

5. Foreign vessels found trading, fishing, hunting, etc., in Russian waters without a license or permit from the Governor-General, and also those possessing a license or permit who may infringe the existing by-laws on hunting, shall be confiscated, both vessels and cargoes, for the benefit of the Government. This enactment shall be enforced henceforth, commencing with A. D. 1882.

6. The enforcement of the above will be intrusted to Russian men-of-war, and also to Russian merchant vessels, which for that purpose will carry military detachments and be provided with proper instructions.

(Signed) A. PELIKAN,
His Imperial Russian Majesty's Consul.

YOKOHAMA, *November 15, 1881.*

This proclamation was distributed to all outgoing vessels, and evidently had some effect, as the raids during the years following fell off very considerably. A few skippers, more desperate than the others, however, were still taking chances. Thus, on August 12, 1883, the schooner *Otome*, of Yokohama, with a Japanese crew, but European officers, raided the North Rookery on Bering Island, though with disastrous results. After having tried the watchfulness of the natives during dark and foggy nights for more than two weeks, three boats were sent ashore from the *Otome* on the 12th of August after dark. At Tizikof, the southern extremity of the rookery, about 350 bachelor seals were clubbed, and the skinning was already far advanced when the natives crept up to the pirates and captured the mate. The next morning the schooner was seized by Mr. Grebnitski on board the steamer *Aleksander II.* The *Otome* was finally taken to Vladivostok and condemned. The captain was charged with piracy, but Mr. Snow, who had passage in the schooner, was allowed to go, as there was no proof of his connection with the affair as owner or supercargo.

The fact that the proclamation did not entirely stop the raiding, induced the Russian authorities in 1884 to station a detachment of soldiers on the islands for their protection, as related elsewhere in this report, and the schooner *Saghalien*, raiding the South Rookery on Bering Island, fell the first victim to the regulars. She had 216 skins.

But even the presence of the soldiery could not deter the more daring of the raiders. Thus, in 1885, the *Nemo* secured 278 seals on Bering Island, according to Captain Snow's own statement, but when in the same vessel he tried to raid the Copper Island sea-otter rookery in 1888, it nearly cost him his life. (Fur Seal Arb. II, p. 188.)

The captains of most of the schooners were becoming wary, however, and, to avoid being captured within the 3-mile limit of the territorial waters, adopted the tactics of keeping some distance at sea, only sending their boats or canoes to kill the seals on or off the rookeries, as the case might be.

The first schooner caught in this practice seems to have been the British vessel *Araunah*, Captain Sieward, which was seized off Copper Island on July 1, 1888, by Grebnitski, in the *Aleksander II.* The significant point was that while the schooner itself was not nearer than 6 miles, two of its canoes were hunting seals within half a mile of the shore, and, in spite of the diplomatic remonstrances by Great Britain, Mr. Grebnitski was fully sustained by Mr. Giers, the Russian minister for foreign affairs, in his letter of August 16, 1889. However, although caught as a raider, the *Araunah* was in reality a regular pelagic sealer from British Columbia, with Indian hunters and Indian canoes.

In 1888 the *Maggie Mac* was also near Copper Island, at least her boats, as testified by T. H. Brown, one of the boat steerers; in fact, so near that "we were shot at from the shore, a number of bullets piercing our boat." (Venning's Rep., 1893, p. 89.)

PELAGIC SEALING AT COMMANDER ISLANDS.

The tactics described in the closing paragraphs of the chapter relating to the raiding of the rookeries, of sending the canoes in among the breeding seals off the rookeries to kill them in the water while the schooner remained at sea, were the forerunner of pelagic sealing around the Commander Islands. It was claimed by the crew of the *C. G. White*, Captain Hagman, who gave themselves up (in 1890) to the authorities on Copper Island, that they were blown ashore after having lost their vessel; but the natives evidently thought differently, for they fired upon three of the boats as they attempted to land, killing one man and wounding two, while seven bullets went through the boats. However, as the schooner was not captured, the men were sent back to San Francisco in the company's steamer. While it is true that the *James Hamilton Lewis* (formerly the *Ada*) was caught right under the South Rookery of Bering Island in 1891 by the Russian war vessel *Aleut*, it is certain that many of the 416 skins (90 per cent of which it has been stated were females) confiscated were killed at sea.

When but few seals were left on Robben Island and the Kurils to raid, the schooners fitting out in Japan turned their attention to following up the Commander Islands herd on its northward migrations along the outer side of the Kuril chain, adopting the regular methods of pelagic sealing. Owing to the necessity of having heavier and stronger vessels on that coast, because of the much more severe weather and the consequent greater risk, the pelagic sealing developed much slower on the Asiatic side than on the American, and played a comparatively unimportant rôle up to 1892.[1]

The latter year saw the total prohibition of sealing in the eastern, or American, part of Bering Sea, according to the *modus vivendi* between Great Britain and the United States pending the fur-seal arbitration by the Paris tribunal. The sealing fleet was already on their way when they were informed of the closing of Bering Sea, the result being that quite a number of the vessels, rather than return home, made straight for the Commander Islands to try their luck there. No less than 32 Canadian vessels crossed over to the Russian side after having completed their coast catch. In addition, there seems to have been 5 British schooners sailing from Japan, consequently altogether 37 British vessels. To these must be added a few American schooners, of which I have no detailed account at hand. Capt. Charles Lutjens, in the *Kate and Anna*, caught about 150 seals "between from 40 to 100 miles south of the Commander Islands, and these were seized and confiscated" (Fur Seal Arb., VIII, p. 714). The *Henry Dennis* obtained 189 seals, as detailed elsewhere in this report.

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[1] The British Bering Sea commissioners, writing in June, 1892, could therefore state as a "fact that pelagic sealing, as understood on the coast of America, is there [Asiatic coast] practically unknown." It is probable, however, that the real beginning was made already in 1891, though on a smaller scale. Capt. Charles Lutjens, of San Francisco, owner of the schooner *Kate and Anna*, states (Fur Seal Arb., VIII, p. 715) that on going into Bering Sea on June 6, 1891, he was warned out, and went directly to the Russian side, where he got 450 seals. The *Penelope*, Capt. J. W. Todd, of Victoria, was also there that year; also *Beatrice*, Capt. M. Keefe, who got 500 seals there; *Umbrina*, Capt. J. Matthews, 30 seals; *Maud S.*, Capt. A. McKeil; *Ocean Belle*, Capt. W. O'Leary; *Dennis*, Capt. E. P. Miner; *City of San Diego*, *Theresa*, *Viva*, *Geneva*, and probably several others.

These facts are shown in more detail in the following table, which is extracted from the record of the entire British Columbia sealing fleet, as given in the Twenty-fifth Annual Report of the Canadian Department of Marine and Fisheries (pt. II, pp. 60–61).

Report of British Columbia sealing fleet sealing in "Asiatic" waters in the season of 1892.

Schooner.	Lower coast catch.	Upper coast catch.	Asiatic catch.	Total.	Schooner.	Lower coast catch.	Upper coast catch.	Asiatic catch.	Total.
Annie E. Paint	186	412	421	1,019	Mary Ellen	35	507	304	846
Annie C. Moore	64	379	447	990	Mermaid		164	238	402
Arietis		418	738	1,156	Mountain Chief			(seized.)	
Agnes McDonald		591	373	964	Ocean Belle	128	687	646	1,461
Brenda		409	512	921	Oscar and Hattie	25	186	261	(seized.) 472
Carlotta G. Cox	436	1,605	696	2,737	Penelope	345		1,362	1,707
C. H. Tupper	308	967	542	1,817	Rosie Olsen			(seized.)	
Carmolite	174	705	(seized.)	879	Sea Lion	472	629	833	1,934
C. D. Rand	28		(seized.)	28	Sadie Turpel		451	244	695
Dora Siewerd		224	673	897	Teresa	83	306	175	564
E. B. Marvin	183	1,434	430	2,045	Thistle (str.)	79		4	83
Enterprise			507	507	Triumph		284	257	541
Favourite		450	202	652	Umbrina	143	707	623	1,473
Genova	270	420	600	1,290	Victoria	23		558	581
Henrietta	44	108	(seized.)	152	W. P. Sayward	180		900	1,080
Maria			(seized.)		Walter A. Earle	100	1,226	541	1,866
Mascot	107	220	119	446	Walter L. Rich		182	204	386
Maud S.	185	760	748	1,702	W. P. Hall			416	416
May Belle	149	145	230	524					

The total catch by the Canadians alone amounted to about 17,000 skins.[1] Out of this number probably no less than 14,000 were skins of female seals. Adding to this the number of seals killed, but lost, those captured by the United States schooners, and those shot during the northward migration during the spring of that year, it is easy to conceive how enormous and irreparable must have been the blow inflicted upon the *breeding* seals of the Commander Islands during the year 1892.

With over 40 vessels scouring the seas around the islands, their boats and canoes following the female seals as they went to and from the feeding grounds, no wonder that the latter were discovered by the sealers, and in these places undoubtedly most of the damage was done.

But not all the schooners were satisfied with taking the seals outside of the territorial waters of Russia; they adopted the tactics of sending the boats inshore to hunt off the rookeries, and as a consequence many of them had to feel the claws of the bear. The Russian authorities, evidently in anticipation of what would happen, had several cruisers patrolling her seas, and no less than seven schooners, one hailing

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[1]

Total of the "Asiatic catch" in the above table	14,804
Seized by Russian war vessels	2,418
Total	17,222

Some of the skins seized by the Russians were taken on the northwest coast.

from the United States and the other six owing allegiance to Great Britain, were captured by the commanders of the cruisers *Zabiaka*, Captain de Livron, and *Vitiaz*, Captain Zarine, and by Mr. Grebnitski on board the company's steamer *Kotik*. The schooners were taken to Vladivostok, condemned, and sold, except the *Rosie Olsen*, which was rechristened the *Prize* and given to Capt. W. Copp, of the *Vancouver Belle* on condition that he take 37 of the captured sailors to British Columbia. The other sailors were sent home in the American ship *Majestic*, except the men of the schooners *Marie* and *Carmolite*, who were taken to Vladivostok and then shipped to Japan.

The schooners, whose capture created a great excitement in Canadian sealing circles, were as follows:

(1) *C. H. White*, Capt. L. M. Furman, of San Francisco, seized by the *Zabiaka* July 16, between Copper Island and Bering Island. (Fur Seal Arb., VII, pp. 203–205.)

(2) *Willie McGowan*, of Shelburne, N. S., seized by the *Zabiaka* July 18,[1] about 18 miles[2] southwest of Palata, Copper Island.

(3) *Rosie Olsen*, of Victoria, B. C., seized by Mr. Grebnitski, July 26, in 55° 23′ north latitude and 165° 27′ east longitude, or about 10 miles northwest of Zapadni Mys, Bering Island.

(4) *Ariel*, of Victoria, B. C., seized by the *Zabiaki*, on July 28, apparently about 10 miles southwest of the Copper Island rookeries.[3]

(5) *Vancouver Belle*, of Vancouver, seized by the *Zabiaka*, on August 12, about 17 miles south of the southern extremity of Copper Island.

(6) *Marie*, of Maitland, N. S., seized by Mr. Grebnitski, August 21, in 54° 36′ north latitude and 168° 24′ east longitude, or about 9[4] miles northeast from the south end of Copper Island, nearest land.

(7) *Carmolite*, of Vancouver, seized by the *Vitiaz* (with Admiral S. O. Makarof on board), August 29, in 54° 29′ north latitude and 168° 2′ east longitude, about 6 miles[5] southeast of the isthmus (Peresheyek) of Copper Island.

In addition, (1) one boat and crew belonging to the schooner *Marvin* were seized by the natives on one of the Copper Island rookeries for killing seals. (2) Three boats and crews, having clubbed seals on the rookeries, were captured by the *Zabiaka* on July 21, 9 miles from the southern extremity of Copper Island. They belonged to the schooner *Sayward*. (3) Two boats and 6 sailors from the *Annie C. Moore* were caught on one of the rookeries by the natives.

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[1] By some mistake the date is given as June 6 in the report of the Russian commission as rendered in the 26th Ann. Rep. Canad. Dept. Fish., p. CLIX. July 6, old style, is probably intended.

[2] In the same report the distance from the coast is given as 21 miles, although the position is said to have been 54° 21′ north latitude and 167° 43′ east longitude, which is a trifle more than 18 miles from the nearest point of Copper Island.

[3] The positions and distances in the report quoted above are so contradictory that it is hard to tell which is meant to be correct. Thus, in the present case, it is stated (p. CLIX) that "The schooner *Ariel* was seized by the cruiser *Zabiaka* on the 16th July [old style] at 3.30 a. m., in 54° 31′ north latitude and 167° 40′ east longitude. At the time of the seizure she was making away from the coast under easy sail, and was 21 miles from Copper Island." Of course both statements can not be correct.

[4] Seven in the report above referred to.

[5] Eight miles, according to the above report.

The number of skins taken from the British schooners was as follows:

Name of vessel.	No. of skins.
Marie	622
Rosie Olsen	379
Carmolite	608
Vancouver Belle	594
W. McGowan	76
Ariel	139
Total	2,418

The confiscated skins were sold by auction, part in Petropaulski, part in London.

The prize moneys from the sale of the schooners and outfits were distributed among the captors.

It will be seen that all of the British schooners were captured outside of the 3-mile limit, and diplomatic remonstrances and claims for damages were at once made by Great Britain. The Russian Government appointed a special commission to investigate the seizures, and found that the *Marie*, *Rosie Olsen*, *Carmolite*, and *Vancouver Belle* were properly seized, as their boats had been sealing in territorial waters, while the proof that the *Willie McGowan* and *Ariel*, or their boats, had been sealing inside the 3-mile limit was considered insufficient. The findings of the commission are rendered in detail in the Twenty-sixth Annual Report of the Canadian Department of Fisheries. The Russian Government accordingly signified their readiness to proceed to an assessment of the indemnity to be paid to the owners of these two vessels. (Twenty-eighth Ann. Rep., Can. Dept. Fish., p. 79.)

The experience of 1892 was conclusive proof that it was feasible for the schooners to stay 20 miles away from the islands and yet send in their boats to the rookeries to prey upon the breeding seals going to and fro. It was also made plain that there would be very little chance of stopping the traffic by means of large cruisers patrolling the sea. The Russian authorities therefore were very anxious to establish a prohibitive zone around the islands wide enough to make it impossible for the boats to raid the rookeries independently, the mere presence of the schooner inside of this limit being evidence of illegal sealing. Negotiations were progressing during the winter of 1892 and 1893 between the two Governments, and finally, in May, 1893, a provisional agreement was entered into between Russia and Great Britain establishing a protective zone of 30 miles around the Commander Islands and Robben Island. It is evident that the Russian authorities at that time were unaware of the fact that the great bulk of the skins taken by the British Columbia sealing fleet were obtained on the feeding grounds of the breeding females, and were also ignorant of the exact location of these grounds, or they would not have rested satisfied with the zone of 30 miles, which has been of but very little protective value to the seals. In view of the rôle which the Russian acceptance of this 30-mile zone played in the establishment of the 60-mile zone around the Pribilof Islands, it is important to remember that in accepting the 30-mile zone the Russians had a much more limited object in view, viz, to make it impossible for the pelagic sealers to raid the rookeries.

THE PROVISIONAL AGREEMENT OF MAY, 1893.

The provisional arrangement, which was to be entirely without retroactive force as regards the British vessels seized in 1892, is as follows:

I. During the year ending December, 1893, the English Government will prohibit their subjects from killing or hunting seal within a zone of 10 marine miles on all the Russian coasts of Bering Sea and the North Pacific Ocean, as well as within a zone of 30 marine miles around the Komandorsky Islands and Tulénew (Robben Island).

II. British vessels engaged in hunting seals within the aforesaid zones, beyond Russian territorial waters, may be seized by Russian cruisers, to be handed over to British cruisers or to the nearest British authorities. In case of impediment or difficulty, the commander of the Russian cruiser may confine himself to seizing the papers of the aforementioned vessel, in order to deliver them to a British cruiser or to transmit them to the nearest British authorities on the first opportunity.

III. Her Majesty's Government engage to bring to trial before the ordinary tribunals, offering all necessary guaranties, the British vessels which may be seized as having been engaged in sealing within the prohibited zones beyond Russian territorial waters.

IV. The Imperial Russian Government will limit to 30,000 the number of seals which may be killed during the year 1893 on the coasts of the islands of Komandorsky and Tulénew (Robben Island).

V. An agent of the British Government may visit the aforementioned islands (Komandorsky and Tulénew) in order to obtain from the local authorities all necessary information on the working and results of the agreement arrived at, but care should be taken to give previous information to these authorities of the place and time of his visit, which should not be prolonged beyond a few weeks.

VI. The present arrangement has no retroactive force as regards British vessels captured previously by the cruisers of the Imperial Russian Marine.

The British Parliament enacted the necessary legislation (Seal Fishery, North Pacific, Act 1893), an "order in council" was passed July 4, 1893, and the agreement went into effect.[1] The Russian war vessels the *Zabiaka* and the *Yakut*, the latter a small transport, as well as two British cruisers, kept up a constant patrol of the 30-mile zone.

The success of 1892 and the continued closure of the American side of Bering Sea during 1893 drove the great majority of the sealing fleet over to the Asiatic side early in the season, and the Commander Islands herd was, therefore, preyed upon to a previously unknown extent along the Japan coast during the migration, in addition to the slaughter of the females on the feeding grounds. No less than 36 Canadian schooners were sealing off the Commander Islands, mostly outside the 30-mile limit, and made a haul of 12,052 skins, while 22 schooners had hunted off the Japan coast, obtaining a total of 30,617 skins. It is stated that, in addition to the above figures relating to the Canadian fleet, the number of skins landed at Hakodate, Japan, by 22 American vessels was 18,582, and by one Hawaiian vessel 3,212, a total of 21,794 skins, and the total for American fleet was 24,924, as given by Fraser (Stat. Catch 1896, pp. 33, 35). A small percentage of these was undoubtedly contributed by the Kuril herd and Robben Island seals, but considering these equalled by the catch of the unreported Japanese schooners it is safe to say that the pelagic sealing of 1893 yielded about

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[1] The act of 1893 expired on July 1, 1895, and it consequently became necessary to provide legislation continuing the agreement with Russia. The new act (Seal Fisheries, North Pacific, Act 1895) contains various changes for the benefit of the pelagic sealers. The act and the consequent order in council (November 21, 1895), with a comparison of the provisions of the acts of 1893 and 1895, are given in the Twenty-eighth Annual Report of the Canadian Department of Fisheries (pp. 172-179).

67,000 Commander Island skins, the majority females. How many more were wastefully killed and lost it is impossible to say.

I append a list of the Canadian vessels sealing on the Asiatic side in 1893, extracted from the Twenty-sixth Annual Report of the Canadian Department of Fisheries (pp. CLXVI–CLXVII), with additions from Venning's report, as follows:

Report of vessels of British Columbia sealing fleet sealing on the "Russian side," season 1893.

Vessels.	Tons.	Crews.		Boats.	Canoes.	Masters.	Catch.	
		White.	Indian.				Japan coast.	Russian side.
Victoria, B. C.:								
Triumph	98	7	28	4	14	C. N. Cox		623
Sapphire	108	8	26	12	3	Wm. Cox		341
E. B. Marvin	117	27		8		J. Gould		517
Mascot	40	7	14	2	7	H. F. Sieward		327
Dora Sieward	94	24		7		R. O. Lavender		434
Minnie	46	5	20	2	10	J. Mohrhouse		20
Annie E. Paint	82	23		8		A. Bissett		401
Diana	50	19		6		A. Nelson		294
Mermaid	73	23		8		W. H. Whiteley	940	315
Fawn	59	3	21	2	10	L. Magnesen		77
Ocean Belle	83	25		8		T. O'Leary		547
Arietis	86	23		7		A. Douglass	920	464
Ainoko	75	5	14	1	7	G. Heater		46
Katharine	82	6	19	2	9	W. D. McDougal		363
Enterprise	69	24		7		J. W. Todd	1,027	274
Agnes McDonald	107	25		7		M. F. Cutler	2,333	433
Viva	92	23		6		J. W. Anderson	1,441	30
Umbrina	98	24		7		C. Campbell	1,827	625
Vera	60	19		5		W. Shields	1,910	99
Otto	86	8	24	2	12	M. Keefe		397
Mary Taylor	42	18		5		E. Shields		240
Brenda	100	26		8		C. F. Locke		408
Libbie	93	23		7		F. Hackett	1,242	389
City of San Diego	46	14		5		M. Pike	942	101
Geneva	92	26		8		W. O'Leary	1,612	454
Casco	63	19		6		O. Buckley	1,473	199
Carlotta G. Cox	76	24		7		W. D. Byers	2,396	376
Oscar and Hattie	81	24		7		W. E. Baker	1,178	1,020
Teresa	63	20		6		E. Lorenz	677	147
Sadie Turpel	56	24		7		C. Le Blanc	927	475
Maud S	97	24		7		R. E. McKeil	989	58
Mary Ellen	63	23		7		W. O. Hughes	1,573	406
Walter L. Rich	76	24		7		S. Balcom		517
Annie C. Moore	113	26		8		J. Daley	822	333
Walter P. Hall	98	23		7		J. B. Brown	708	263
May Belle	58	20		5		C. J. Harris	1,852	
Penelope	70	20		6		F. Cole	2,291	
Vancouver:								
Beatrice	49	21		6		A. G. Bjerre	1,411	39
Indian canoe catch							66	
Total							30,617	12,052

Wise by experience, the sealing fleet kept pretty well outside the 30-mile zone, though the following seizures of British vessels were made:

(1) *Minnie*, of Victoria, British Columbia, seized by the *Yakut*, July 17, 21 miles southeast of Copper Island.

(2) *Ainoko*, of Victoria, British Columbia, seized by the *Yakut*, July 22, 16 miles south of Copper Island.

(3) *Maud S.*, of Victoria, British Columbia, seized by the *Yakut*, August 29, 22 miles southwest of Copper Island.

(4) *Arctic*, of Shanghai, seized by the *Zabiaka* within the 30-mile zone.

Of these, only the *Minnie* was afterwards condemned.

The provisional agreement as given above was renewed in 1894 and 1895 for those years. Owing to the threatening political aspects, as a consequence of the Japanese-Chinese war, the Russian Government had only one ship patrolling the 30-mile limit in 1895. The British cruiser *Caroline* did patrol duty early in the season, and was relieved by the *Porpoise*, Capt. Francis R. Pelly, commanding. No seizures were made in that year.

As schooners flying the flag of the United States were also among the fleet preying upon the Commander Islands herd, it was found necessary to establish a *modus vivendi* with the United States similar to the provisional agreement with Great Britain. An arrangement, differing only in a few verbal changes from the latter, was drawn up by the Imperial minister for foreign affairs, Mr. Giers, and signed in Washington by the representatives of the respective Governments on May 4, 1894. The exact text of this arrangement, which "shall only be in force until further orders," is found in Executive Document No. 67, Senate, Fifty-third Congress, third session, being the President's Message regarding the Enforcement of Regulations respecting Fur Seals, page 82.

The Twenty-seventh Annual Report of the Canadian Department of Fisheries contains an account of the Canadian pelagic sealing operations on the Asiatic side during 1894, by Mr. R. N. Venning, from which we quote the following abstracts:

> The vessels this year operating in the vicinity of the Russian seal islands are reported to have kept well outside the protective zone, principally working about 100 miles southeast of Copper Island. As a consequence, the present year's operations are marked by an almost total absence of interference with the Canadian fleet by Russian authorities.
>
> The only instance reported is that of a sealing boat of the schooner *May Belle*, of Victoria, British Columbia, manned by Joseph Morrell, Charles K. Leclaire, and James Costin, which lost the vessel in a fog, and after remaining out all night and failing to find the schooner on the following morning, the occupants, fearing a storm which was threatening, made for the shore of Copper Island for shelter. They were discovered and arrested before landing.
>
> The boat and her equipment were retained at Copper Island and the three men were taken to Petropaulovski, on the mainland of Kamchatka, where, after a detention of 32 days, they were handed over to Her Majesty's ship *Daphne*, taken to Yokohama, Japan, and delivered to Her Majesty's consul at that port.
>
> They were imprisoned, but released some four hours later, and informed by the consul that the charge against them was not sufficient for their detention. They were accordingly sent by Her Majesty's consul to Victoria, British Columbia, by Canadian Pacific Railway steamship, where they arrived on the 20th November, 1894.
>
> Claims for damages have been filed by the parties and by the owners of the sealing boat, and representations have been made to Her Majesty's government on the subject.

Report of vessels of British Columbia sealing fleet in the vicinity of Copper Island, season 1894.

[From 27 Ann. Rep. Canada Dept. Fish.]

Vessels.	Tons.	Crews.		Boats.	Canoes.	Masters.	Catch.	
		White.	Indian.				Japan coast.	Vicinity Copper Island.
Victoria:								
Enterprise	69	22		8		O. Scarf	1,254	314
Rosie Olsen	30	6	16	2	8	A. B. Whidden	1,043	
Umbrina	99	25		8		C. Campbell	2,588	153
Oscar and Hattie	81	24		7		A. Folger	1,733	176
Diana	50	19		6		A. Nelson	1,961	433
Brenda	100	26		8		C. E. Locke	2,383	343
Arietis	86	25		8		A. Douglass	1,197	
Casco	63	22		6		O. Buchols	1,926	
Dora Sieward	94	26		8		F. Cole	2,584	
Walter A. Earle	68	8	20	2	10	L. Magnesen	1,471	
Fawn	59	6	18	1	9	M. Keefe	911	
Agnes McDonald	107	26		8		M. Cutler	1,707	471
W. P. Hall	99	24		7		J. B. Brown	710	*a* 251
Mermaid	73	25		8		W. H. Whiteley	1,603	505
City of San Diego	46	16		5		M. Pike	1,304	250
Mary Taylor	43	19		5		E. Robins	874	250
Libbie	93	22		7		F. Hackett	1,010	200
May Belle	58	14		6		E. Shields	925	197
Mary Ellen	63	23		7		W. O. Hughes	1,909	86
Viva	92	26		7		J. Anderson	1,437	
W. P. Sayward	60	20		6		G. Ferey	606	35
Penelope	70	20		7		L. McGrath	1,306	296
Vera	60	19		6		W. S. Shields	1,075	
Carlotta G. Cox	76	24		7		W. Byers	1,947	
Otto	86	25		8		J. McLeod	1,014	623
E. B. Marvin	96	23		7		C. J. Harris	2,118	
Annie E. Paint	82	26		9		A. Bassett	1,497	531
Geneva	92	27		9		W. O'Leary	1,092	558
Teresa	63	25		7		F. Gilbert	1,102	120
Ocean Belle	83	22		6		T. O'Leary	530	274
Sadie Turpel	56	22		8		C. Leblanc	1,783	171
Maud S	97	24		8		R. McKiel	1,343	86
Aurora	41	18		5		H. J. Lund	693	21
Florence M. Smith	99	27		8		J. Allen	96	81
Mascot	40	4	16	1	7	H. F. Sieward	558	
Pioneer	66	24		6		W. E. Baker		1,263
Vancouver:								
Beatrice	49	21		6			1,703	
Total							48,993	7,688

a These were landed at Yokohama according to a statement by Mr. E. J. King.

The catch of the American vessels during the same year was considerably smaller than that of the Canadians, especially off the Russian islands, but with the above, and that of a few Japanese schooners (965 skins), swell the loss of the Commander Island herd to the enormous figure of 93,149 skins actually accounted for. The following table is based in part upon the one furnished by Mr. A. B. Alexander (Rep. Cond. Pribil. Isls., 1893-95, II, p. 26).

Fur-seal catch of American vessels on the Asiatic side, season 1894.

Vessel.	Japan coast.	Vicinity Copper Island.	Remarks.
Alton	1,185	....	
Alexander	810	....	
Anaconda	397	....	
Anna Matilda	765	....	
Allie I. Algar	1,091	15	
Bonanza	1,724	....	
Bowhead	1,407	....	
C. G. White	936	....	
Emma and Louisa	1,166	....	
Eppinger	1,080	....	
Edward E. Webster	1,650	....	
George Peabody	231	....	
George R. White	956	....	
H. C. Wahlberg	326	....	
Henry Dennis	855	....	
Herman	968	324	
Jane Grey	1,155	....	
Kate and Ann	672	....	
Louis D	1,600	....	
Louis Olsen	1,112	....	
Lillie L	594	84	
Josephine	150	....	
Mary H. Thomas	*a* 500	....	Lost; exact number of skins unknown.
Mascotte	535	....	Lost; skins not saved.
Mattie T. Dyer	862	290	
Mathew Turner	857	....	Do.
Penelope	656	....	
Prescott	325	102	
Retriever	837	661	
Rattler	1,046	109	
Rosie Sparks	420	....	
Sophie Sutherland	1,788	....	
San Diego	600	....	Do.
Teresa	686	....	
Willard Ainsworth	893	201	
Winchester	1,606	....	
Arctic	256	....	
Fortuna	*a* 500	....	Lost; exact number of skins unknown.
Unga	*a* 500	....	Do.
Total	33,717	1,786	

a About.

The pelagic sealing seasons of 1894 and 1895 are most notable for the excessive number of skins taken during the migration and for the falling off in the catch on the Copper Island feeding grounds, indicating the approaching exhaustion of this locality. But, in addition, the latter year is notable for being the first year in which pelagic sealers have to any extent attacked the feeding-grounds of the Bering Island rookeries.

It has been long known that seals occurred in summer in the waters northwest of Bering Island, from Cape Kamchatka to Karaginski Island; but it seems as if in 1895 the sealers repaired there systematically and with success. I am indebted to Mr. C. H. Townsend for this information and for the following abstracts of the logs of the schooners *Ida Etta*, sealing off Cape Nagikinski, and *Jane Grey*, sealing off Cape Afrika.

Schooner Jane Grey.

Date.	Location.	Seals.
1895.		
Aug. 16	56° 44′ N. 164° 25′ E.	28
17	56° 09′ N. 164° 10′ E.	8
18	56° 09′ N. 164° 10′ E.	2
19	56° 09′ N. 164° 10′ E.	1
20	56° 09′ N. 164° 10′ E	13
21	56° 09′ N. 164° 10′ E.	13
	Total	65

Schooner Ida Etta.

Date.	Location.	Seals.
1895.		
Aug. 20	Cape Nagikinski, SW. 30 miles	37
21	Cape Nagikinski, SW. 20 miles	35
24	Cape Nagikinski, SW. 20 miles	28
26	Cape Nagikinski, SW. 20 miles	28
27	Cape Nagikinski, W. 30 miles	10
31	Cape Nagikinski, W. 30 miles	3
Sept. 1	Cape Nagikinski, WSW. 25 miles	25
2	Cape Nagikinski, SW. 20 miles	6
3	Cape Nagikinski, SW. 30 miles	4
4	Cape Nagikinski, SW. 25 miles	4
	Total	180

Report of vessels of British Columbia sealing fleet in the vicinity of Copper Island, season 1895.

[From 28 Amr. Rep. Canada Dept. Fish.]

Vessels.	Tons.	Crews.		Boats.	Canoes.	Masters.	Catch.	
		White.	Indian.				Japan coast.	Vicinity Copper Island.
Agnes McDonald	107	28	14	8	7	M. F. Cutler	711	
Annie F. Paint	82	26		8		A. Bissett	1,121	135
Arietis	86	22		7		O. Scarf	680	426
Borealis	37	21		6		E. Robbin	801	110
Brenda[a]	100					C. E. Locke	881	
C. G. Cox	76	26		8		C. J. Harris	920	22
Casco	63	19		6		C. Le Blanc	1,308	851
City San Diego	46	17		5		S. Pike	370	243
Diana	50	19		6		A. Nelson	872	292
Director	87	23		7		F. W. Gilbert		71
E. B. Marvin	96	27		8		W. D. Byers	949	10
Fortuna	97	18		5		J. Cousins	210	
Geneva	92	29		9		W. O'Leary	1,137	470
Mary Ellen	63	10	20	5	10	G. R. Ferey	854	
Mary Taylor	43	18		5		R. O. Lavender		434
Mascot	40	7	16	2	8	E. Lorenz	787	168
Mermaid	73	24		7		W. H. Whitely	1,113	753
Ocean Belle	83	23		7		P. Martin	1,056	562
Otto	86	8	32	3	14	J. McLeod		30
Pioneer	66	24		7		W. E. Baker	845	790
Rosie Olsen[a]	39					A. B. Whidden	627	
Sadie Turpel	56	19		6		J. Anderson	798	470
Umbrina	99	25		7		C. Campbell	1,187	562
Vera	60	19		6		W. Shields	853	15
Viva	92	23		7		M. Pike	601	367
Total							18,687	6,281

[a] Wrecked.

The Asiatic catch of 1895, or, what is equivalent, the catch from the Commander Islands herd, clearly showed how excessively that herd had suffered, for it fell from over 93,000 in 1894 to less than 43,000. In other words, the schooners secured more than 50,000 less than the year previously. The figures are derived from the official statistics of the United States Treasury Department (Stat. Fur-Seal Catch, 1896, p. 34), and from the Report of the Canadian Department of Fisheries, an abstract from which is appended below. To the figures contained in these documents must be added the skins secured by Japanese sealers and sealers domiciled in Japan. From information gathered by myself in Japan these schooners secured at least 5,771 skins, viz, 4,684 off the coast of Japan and 1,087 on the feeding grounds of the Commander Islands seals. The detailed list of these catches is published later on in this volume in my Report on the Fur-Seal Industry of Japan (pp. 291–303).

The pelagic Asiatic catch of 1895 consequently fell off about 54 per cent.

That of 1896 shows a still further decrease. According to official sources, the Commander Islands herd was preyed upon by 36 Canadian and United States schooners, which took 22,613 skins off the Japan coast and 1,578 off the Commander Islands feeding grounds. (Stat. Tab. Fur-Seal Catch, 1896, p. 34.) To these must be added 4,967 skins taken by schooners owned in Japan, a total of a little over 29,000 skins, or more than 4,000 skins less than in 1892, when the pelagic sealing first started in earnest on the Asiatic side. The detailed figures of the catch will be found in the following tables, the first of which is derived from the statistical tables quoted above (pp. 6, 7):

Report of vessels of United States sealing fleet in Asiatic waters, season 1896.

Vessels.	Tons.	Crews.		Boats.	Canoes.	Masters.	Catch.	
		White.	Indian.				Japan coast.	Vicinity Copper Island.
Louisa D.	90	23		7			534	
Elsie	57	22		6			665	272
M. M. Morrill	43	16		5			639	
Rattler	93	22		7			649	
Alton	84	37		8			546	
W. Ainsworth	40	22		5			724	
St. Lawrence	39	18	8	1	8		405	
Jane Grey							487	
Total							4,649	272

It will be noted that only one vessel domiciled in the United States hunted on the Commander Islands feeding grounds. Of the 272 skins secured there 19 were males and 253 females. The skins taken in Japanese waters were 1,820 males, 2,788 females, and 37 the sex of which was not ascertained.

The following report of the Canadian vessels is from official sources, but it is not stated whether the statement as to the sex is verified by inspectors or not:

Pelagic catch of Canadian sealing vessels in Asiatic waters, season 1896.

[From the official report of Collector A. R. Milne.]

Vessels.	Tons.	Crew.		Boats.	Canoes.	Masters.	Catch.			
							Japan coast.		Vicinity of Copper Island.	
		White.	Indian.				Males.	Females.	Males.	Females.
Agnes McDonald						M. F. Coulter	235	310		
Allie I. Algar						C. E. Locke	397	262	16	32
Annie E. Paint						A. Bissett	419	396		
Arietis						P. Martin	715	319		
Aurora						T. H. Brown	44	281	16	19
Borealis						A. Wasberg	82	245		
Carlotta G. Cox						W. D. Byers	552	670		
Casco						C. Le Blanc	186	622	63	139
Diana						A. Nelson	475	522	19	76
Director						F. W. Gilbert	460	433	85	98
E. B. Marvin						C. J. Harris	397	439		
Florence M. Smith						L. McGrath	396	206		
Fortuna						Thos. O'Leary	162	372	44	171
Geneva						W. O'Leary	190	309	162	289
Ida Etta						W. O. Hughes	195	455	3	10
Katharine						J. E. Fulton	99	116		
Mary Taylor						R. O. Lavender	174	209		
Mascot						E. Lorenz	99	93		
Mermaid						W. H. Whitley	438	502		
Ocean Belle						A. B. Whidden	154	430		
Otto						J. McLeod	534	185		
Pioneer						W. E. Baker	439	410	30	14
Sadie Turpel						A. S. Crane	288	294		
Teresa						G. Meyer	130	101		
Triumph						C. N. Cox	348	258	7	13
Umbrina						C. Campbell	265	477	34	7
Vera						Wm. Shields	317	255		
Viva						M. Pike	280	827		
Total							8,470	9,408	479	827
Total							17,968		1,306	

Report of vessels of the United States sealing fleet in Asiatic waters, season 1897.

Vessels.	Tons.	Crews.		Boats.	Canoes.	Catch.					
						Japan coast.			Vicinity Commander Islands.		
		White.	Indian.			Males.	Females.	Total.	Males.	Females.	Total.
Elsie	57					177	435	612			
St. Lawrence	39					144	517	661			
Total						321	952	1,273			

Pelagic catch of Canadian sealing vessels in Asiatic waters, season 1897.

[From the official report of Collector A. R. Milne.]

Vessels.	Tons.	Crew.		Boats.	Canoes.	Masters.	Catch.			
							Japan coast.		Vicinity of Copper Island.	
		White.	Indian.				Males.	Females.	Males.	Females.
Agnes McDonald [a]						M. F. Cutter	308	181		
Annie E. Paint						A. Bissett	373	446	6	9
Borealis						A. Nelson	154	154	2	4
Casco						C. Le Blanc	432	430	49	189
C. G. Cox						W. D. Byers	381	637	85	163
Director						F. W. Gilbert	426	439	56	127
Geneva						W. A. Leary	120	269	88	249
Mermaid						J. W. Anderson	468	362	40	102
Pioneer						W. E. Baker			128	135
Sadie Turpel						A. S. Crane	430	217		
Umbrina						C. Campbell	433	385		
Vera						W. F. Bragg	152	124		
Total							3,677	3,644	454	928
Total							7,321		1,382	
Total in Asiatic waters							8,703			

[a] Lost.

The records of the catch by the schooners domiciled in Japan are found in my report on the Fur Seal Industry of Japan, page 275.

During the eight years, 1890 to 1897, inclusive, the "Asiatic catch" by pelagic sealers may be summed up as follows:

Year.	Vessels sailing from—	Japan catch.	Russian catch.	Totals.
1890	United States	476	59	535
1891	United States	1,687	1,816	3,503
	Canada		6,616	6,616
	Total	1,687	8,432	10,119
1892	United States	12,064	4,450	16,514
	Canada		17,222	17,222
	Total	12,064	21,672	33,736
1893	United States	24,320	604	24,924
	Canada	30,617	12,052	42,669
	Total	54,937	12,656	67,593
1894	United States	33,717	1,786	35,503
	Canada	48,993	7,688	56,681
	Japan	965		965
	Total	83,675	9,474	93,149
1895	United States	11,301	766	12,067
	Canada	18,687	6,281	24,968
	Japan	4,684	1,087	5,771
	Total	34,672	8,134	42,806
1896	United States	4,649	272	4,921
	Canada	17,968	1,306	19,274
	Japan	3,461	1,506	4,967
	Total	26,078	3,084	29,162
1897	United States	1,273		1,273
	Canada	7,321	1,382	8,703
	Japan	4,414	833	5,247
	Japan (foreign flag)	1,455	650	2,105
	Total	14,465	2,865	17,328
	Grand total			294,428

It will be seen that the known pelagic "Asiatic catch" from 1892–97 was about 295,000 skins. Allowing 8,000 skins for the Kurils and Tiuleni, the *known* loss in that period to the Commander Islands herd was about 287,000 seals, apart from the loss of wounded ones, etc. The number of seals killed on the islands in the same period was 119,708. The pelagic *catch* was therefore considerably more than twice as large as that on the islands, while the loss to the herd from that cause was much greater, due to starved pups and seals shot but not secured. It is certainly no exaggeration to say that *the actual loss to the herd in those six years has averaged 100,000 a year, more than one-half of which were females, while even in the palmiest days of exclusive land sealing the loss only averaged 50,000 seals a year, all males.*

EXTRACTS OF SEALING LOGS.

Catch of seal skins on board of British schooner Umbrina, 1892.

Date.	Latitude.	Longitude.	Remarks.	Daily catch.	Totals.
1892.	° ′	° ′			
July 20	53 50 N.	167 30 E.	Killed from schooner	2	855
22	53 50 N.	167 30 E.	do	1	856
23	53 40 N.	167 10 E.	do	1	857
24	53 40 N.	166 10 E.	Boats out all day	17	874
25	53 50 N.	167 00 E.		12	886
26	53 40 N.	166 30 E.		65	951
27	53 30 N.	166 25 E.		68	1,019
28	53 40 N.	166 50 E.		27	1,046
Aug. 1	53 30 N.	166 50 E.		3	1,049
2	53 40 N.	166 55 E.		10	1,059
3	53 34 N.	166 40 E.		8	1,097
4	53 40 N.	165 30 E.		65	1,132
5	53 45 N.	165 10 E.		72	1,204
6	53 55 N.	165 10 E.		56	1,260
7	54 10 N.	165 30 E.		10	1,270
10	53 40 N.	166 30 E.	Killed from schooner	1	1,271
11	53 47 N.	166 40 E.		5	1,276
12	53 40 N.	166 50 E.	Killed from schooner	1	1,277
16	53 55 N.	167 00 E.		8	1,285
17	55 55 N.	166 50 E.		21	1,306
18	53 30 N.	166 45 E.		25	1,331
19	53 40 N.	166 40 E.	Killed from schooner	1	1,332
21	53 35 N.	166 35 E.		15	1,347
22	53 35 N.	166 45 E.		55	1,402
23	53 50 N.	166 35 E.	Killed from schooner	2	1,404
24	54 00 N.	166 35 E.		62	1,466
25	53 50 N.	166 30 E.	Killed from schooner	1	1,467
26	54 00 N.	166 35 E.	do	1	1,468
30	53 35 N.	166 30 E.	do	2	1,470
31	53 30 N.	166 40 E.	do	3	1,473
				620	

Extract of return showing the dates on which seals were taken, the number taken each day, and the noon position on each such dates, of the schooner Maud S. on her sealing voyage for the season 1892.

Date.	No. of seals taken.	Latitude.	Longitude.
1892.		° ′	° ′
July 14	11	53 10 N.	166 10 E.
15	10	53 33 N.	166 55 E.
21	10	53 33 N.	165 29 E.
22	12	53 12 N.	165 46 E.
23	7	52 49 N.	167 22 E.
26	1	53 24 N.	166 36 E.
27	57	53 24 N.	168 04 E.
28	99	53 21 N.	168 08 E.
28	14	53 33 N.	168 09 E.
Aug. 2	3	54 10 N.	167 11 E.
3	8	53 55 N.	166 45 E.
4	12	53 50 N.	166 59 E.
5	40	53 44 N.	167 04 E.
6	41	53 35 N.	166 01 E.
7	71	53 33 N.	165 51 E.
8	3	53 35 N.	165 49 E.
10	24	54 11 N.	167 00 E.
11	12	53 04 N.	166 40 E.
13	5	53 53 N.	165 14 E.
14	2	54 43 N.	164 58 E.
17	15	56 48 N.	166 15 E.
18	8	56 35 N.	167 25 E.
19	2	55 39 N.	167 57 E.
21	1	53 48 N.	169 10 E.
22	7	53 22 N.	168 02 E.
23	114	52 51 N.	167 45 E.
25	16	52 46 N.	167 35 E.
26	16	52 44 N.	167 58 E.
27	7	52 55 N.	167 34 E.
31	31	52 52 N.	167 38 E.
Sept. 4	12	53 15 N.	167 26 E.
5	30	53 14 N.	167 38 E.
6	1	53 01 N.	167 08 E.
7	34	53 06 N.	167 08 E.
10	9	52 31 N.	167 19 E.
	545		

Extract of return showing the dates on which seals were taken, the number taken each day, and the noon position on each such dates, of the schooner Vancouver Belle on her sealing voyage for the season 1892.

Date.	No. of seals taken.	Latitude.	Longitude.
1892.		° ′	° ′
July 4	3	54 11 N.	168 52 E.
5	2	54 05 N.	167 15 E.
8	1	54 04 N.	167 00 E.
9	18	54 12 N.	169 03 E.
10	2	54 16 N.	169 32 E.
13	3	54 13 N.	169 30 E.
14	22	54 10 N.	168 30 E.
16	1	55 25 N.	167 20 E.
17	1	55 40 N.	166 10 E.
20	1	55 16 N.	168 24 E.
25	8	55 28 N.	170 24 E.
26	2	55 09 N.	169 08 E.
27	8	53 56 N.	169 08 E.
28	103	54 05 N.	167 35 E.
29	11	54 05 N.	167 35 E.
30	1	54 07 N.	167 00 E.
31	1	54 15 N.	167 00 E.
Aug. 1	13	54 04 N.	167 10 E.
2	1	54 10 N.	167 10 E.
3	18	54 20 N.	167 33 E.
4	5	54 12 N.	167 26 E.
5	14	53 54 N.	167 35 E.
6	24	54 10 N.	167 38 E.
7	31	54 13 N.	167 20 E.
8	1	54 20 N.	167 01 E.
10	3	54 20 N.	166 06 E.
11	3	54 15 N.	166 30 E.
	296		

Extract of return showing the dates on which seals were taken, the number taken each day, and the noon position on each such dates, of the schooner Beatrice (Vancouver) on her sealing voyage for the season 1892.

Date.	No. of seals taken.	Latitude.	Longitude.	Total seals to date.
1892.		° ′	° ′	
July 24	1	51 54 N.	168 56 E.	
25	3	53 17 N.	167 48 E.	
26	68	54 17 N.	167 40 E.	
27	112	53 54 N.	167 56 E.	
28	19	53 38 N.	167 30 E.	907
Aug. 1	4	53 28 N.	167 01 E.	
2	15	53 29 N.	168 15 E.	
3	28	53 50 N.	167 18 E.	
4	28	53 23 N.	168 15 E.	
5	47	53 36 N.	167 34 E.	
6	75	53 26 N.	167 36 E.	
7	8	53 22 N.	166 07 E.	
9	12	53 45 N.	166 20 E.	
10	5	53 24 N.	165 52 E.	
11	7	54 07 N.	165 31 E.	
16	12	53 21 N.	166 37 E.	
17	15	53 18 N.	167 04 E.	
18	14	53 10 N.	167 21 E.	
21	9	53 36 N.	169 29 E.	
22	27	53 19 N.	169 00 E.	
23	5	53 29 N.	169 04 E.	
24	21	54 06 N.	168 17 E.	
25	1	53 32 N.	168 12 E.	
	536			

Extract of return showing the dates on which seals were taken, the number taken each day, and the noon position on each such dates, of the schooner Arietis on her sealing voyage for the season 1892.

Date.	No. of seals taken.	Latitude.	Longitude.	Total seals to date.
1892.		° ′	° ′	
July 21	1	54 08 N.	169 00 E.	480
22	25	53 48 N.	169 30 E.	505
25	21	53 30 N.	169 00 E.	526
26	16	53 00 N.	168 45 E.	542
27	160	53 20 N.	169 00 E.	702
28	17	54 00 N.	168 45 E.	719
29	1	54 00 N.	168 55 E.	720
31	5	54 10 N.	168 30 E.	725
Aug. 1	3	54 00 N.	169 00 E.	728
2	5	53 45 N.	168 45 E.	733
3	13	53 40 N.	168 30 E.	746
4	118	53 20 N.	168 15 E.	864
5	154	53 20 N.	168 20 E.	1,038
7	16	53 40 N.	168 45 E.	1,054
8	3	54 00 N.	168 00 E.	1,057
9	4	54 00 N.	168 30 E.	1 061
10	3	53 45 N.	168 00 E.	1,064
18	14	53 00 N.	169 00 E.	1,078
22	25	52 30 N.	167 40 E.	1,103
24	40	53 00 N.	168 00 E.	1,143
29	6	53 00 N.	169 00 E.	1,149
	650			

Extract of return showing the dates on which seals were taken, the number taken each day, and the noon position on each such dates, of the schooner Agnes McDonald on her sealing voyage for the season 1892.

Date.	No. of seals taken.	Latitude.	Longitude.	Total seals to date.
1892.		° ′	° ′	
July 26	18	52 38 N.	168 02 E.	608
27	97	52 48 N.	168 08 E.	705
28	26	52 49 N.	168 00 E.	731
Aug. 1	12	53 30 N.	167 35 E.	743
2	54	53 52 N.	167 05 E.	797
3	17	53 49 N.	167 02 E.	814
4	24	54 03 N.	166 17 E.	838
5	6	54 07 N.	165 05 E.	844
6	4	54 18 N.	165 45 E.	848
7	4	54 05 N.	166 35 E.	852
9	5	54 07 N.	167 15 E.	857
10	3	54 02 N.	167 42 E.	860
11	11	53 42 N.	165 37 E.	871
17	11	53 43 N.	168 02 E.	882
18	18	53 12 N.	165 25 E.	900
20	3	53 05 N.	166 10 E.	903
21	8	52 45 N.	166 58 E.	911
22	52	53 20 N.	167 42 E.	963
25	1	52 28 N.	166 44 E.	964
	374			

Extract of return showing the dates on which seals were taken, the number taken each day, and the noon position on each such dates, of the schooner Annie E. Paint on her sealing voyage for the season 1892.

Date.	No. of seals taken.	Latitude.	Longitude.	Total seals to date.
1892.		° ′	° ′	
Aug. 3	5	52 55 N.	166 40 E.	569
4	3	52 32 N.	166 01 E.	572
5	24	53 04 N.	165 21 E.	596
6	46	52 30 N.	165 30 E.	642
8	53	52 47 N.	165 37 E.	695
12	15	53 00 N.	166 40 E.	710
17	8	53 02 N.	166 46 E.	718
19	33	52 59 N.	166 31 E.	751
21	8	52 48 N.	166 12 E.	759
22	26	52 58 N.	166 14 E.	784
23	48	52 59 N.	166 25 E.	832
27	32	52 58 N.	166 35 E.	864
31	13	52 01 N.	167 00 E.	878
Sept. 5	16	53 00 N.	167 30 E.	894
12	28	53 00 N.	165 58 E.	922
13	19	52 59 N.	165 40 E.	941
20	44	52 00 N.	169 11 E.	985
	421			

Extract of return showing the dates on which seals were taken, the number taken each day, and the noon position on each such dates, of the schooner W. P. Hall on her sealing voyage for the season 1892.

Date.		No. of seals taken.	Latitude.			Longitude.		
1892.			°	′		°	′	
July	21	6	54	25	N.	170	00	E.
	24	5	54	35	N.	169	10	E.
	27	59	54	30	N.	168	50	E.
Aug.	2	19	54	20	N.	168	40	E.
	3	15	54	03	N.	168	55	E.
	4	40	53	35	N.	168	40	E.
	5	49	53	30	N.	169	00	E.
	6	36	54	05	N.	168	30	E.
	8	20	54	35	N.	168	55	E.
	9	40	54	25	N.	169	00	E.
	10	10	54	05	N.	168	35	E.
	11	27	54	10	N.	168	55	E.
	21	8	53	00	N.	169	35	E.
	22	30	52	55	N.	169	00	E.
	27	2	52	20	N.	168	30	E.
		366						

Extract of sealing log of the American schooner Henry Dennis, R. H. Miner, master, for the summer season of 1892.

[From Townsend's report.]

Date.		Latitude.			Longitude.			Number of seals.		
								Male.	Female.	Total.
1892.		°	′		°	′				
July	4	Copper Island in sight, bearing west								7
	6	54	00	N.	168	28	E.			5
	10	54	09	N.	168	53	E.			5
	14	53	46	N.	166	52	E.			6
	15	54	01	N.	168	28	E.			34
	17	54	14	N.	169	17	E.			1
	22	53	59	N.	170	00	E.			2
	23	54	18	N.	169	39	E.			2
	25	54	27	N.	169	38	E.			38
	26	54	39	N.	169	20	E.			3
	27	54	01	N.	160	17	E.			27
	28	53	52	N.	169	21	E.			37
	29	53	46	N.	169	30	E.			7
Aug.	1	56	37	N.	168	30	E.			1
	3	56	40	N.	168	38	E.			13
	4	56	27	N.	168	13	E.			40
	5	56	20	N.	168	07	E.			108
	6	56	37	N.	168	10	E.			26
	7	56	43	N.	167	50	E.			1
	9	54	21	N.	170	00	E.			2
	10	53	35	N.	169	49	E.			15
	11	53	53	N.	168	30	E.			2
	12	53	35	N.	168	50	E.			24
	14	53	10	N.	167	14	E.			1
	18	53	18	N.	169	45	E.			13
	19	53	41	N.	169	51	E.			20
	22	52	36	N.	170	53	E.			3
	23	52	18	N.	169	10	E.			68
	26	52	38	N.	169	45	E.			20
	27	52	24	N.	170	02	E.			31
	28	52	24	N.	170	06	E.			1
Total										563

Extract of sealing log of the British schooner Beatrice, August G. Bjerre, master, for the summer season of 1893.

[From Venning's report.]

Date.	Latitude.	Longitude.	Seals.
1893.	° ′	° ′	
July 22	53 36 N.	168 15 E.	1
23	53 38 N.	168 30 E.	6
24	53 31 N.	168 25 E.	5
25	53 40 N.	168 11 E.	2
27	53 42 N.	168 08 E.	2
28	53 30 N.	168 12 E.	8
Aug. 1	53 46 N.	169 22 E.	1
4	54 05 N.	167 20 E.	1
5	53 36 N.	167 49 E.	4
8	53 05 N.	168 45 E.	2
10	53 22 N.	168 52 E.	4
11	53 18 N.	167 53 E.	1

Extract of sealing log of the British schooner Casco, Otto Bucholz, master, for the summer season of 1893.

[From Venning's report.]

Date.	Latitude.	Longitude.	Seals.
1893.	° ′	° ′	
July 23	53 36 N.	167 01 E.	15
27	53 50 N.	167 17 E.	12
28	53 59 N.	167 25 E.	6
Aug. 1	55 26 N.	168 15 E.	8
9	55 25 N.	163 57 E.	26
10	55 03 N.	164 37 E.	11
11	54 15 N.	165 44 E.	8
12	53 53 N.	166 21 E.	26
13	53 40 N.	166 42 E.	6
14	53 42 N.	167 02 E.	9
17	53 56 N.	169 02 E.	8
19	53 21 N.	168 20 E.	5
21	53 59 N.	168 28 E.	19

Extract of sealing log of the British schooner Arietas, Abel Douglas, master, for the summer season of 1893.

[From Venning's report.]

Date.	Latitude.	Longitude.	Seals.
1893.	° ′	° ′	
July 13	53 20 N.	168 00 E.	1
14	53 04 N.	168 55 E.	1
16	53 17 N.	168 20 E.	3
17	53 55 N.	167 25 E.	67
18	54 00 N.	167 40 E.	2
19	53 48 N.	167 23 E.	2
23	53 52 N.	167 09 E.	16
25	53 33 N.	167 04 E.	21
28	53 48 N.	167 04 E.	26
29	53 28 N.	167 10 E.	1
Aug. 1	53 43 N.	167 46 E.	40
5	53 26 N.	166 51 E.	13
8	53 12 N.	169 16 E.	6
10	53 13 N.	166 30 E.	11
12	54 00 N.	166 49 E.	47
14	53 43 N.	166 18 E.	19
16	54 11 N.	165 35 E.	2
17	53 35 N.	167 28 E.	31
19	53 28 N.	167 33 E.	15
21	52 51 N.	167 55 E.	17
22	53 20 N.	167 46 E.	25
26	53 23 N.	168 40 E.	8
31	53 20 N.	167 00 E.	39
Sept. 1	53 40 N.	167 52 E.	1
4	52 42 N.	168 56 E.	7
5	52 41 N.	169 26 E.	2
Total			423

Extract of sealing log of the British schooner Carlotta G. Cox, William Byers, master, for the summer season of 1893.

[From Venning's Report.]

Date.	Latitude.	Longitude.	Seals.
1893.	° ′	° ′	
July 15	53 45 N.	166 43 E.	10
17	53 46 N.	166 11 E.	17
20	54 25 N.	169 54 E.	2
23	53 49 N.	168 25 E.	9
28	53 17 N.	168 02 E.	19
31	53 09 N.	167 29 E.	1
Aug. 1	53 21 N.	168 09 E.	49
5	53 12 N.	168 00 E.	10
8	53 21 N.	167 20 E.	19
10	53 10 N.	167 51 E.	18
11	52 57 N.	168 13 E.	2
12	53 24 N.	168 04 R.	36
14	53 26 N.	166 35 E.	27
17	53 19 N.	166 38 E.	30
19	53 30 N.	166 31 E.	27
21	53 33 N.	166 38 E.	41
22	53 15 N.	166 48 E.	17
24	53 06 N.	169 06 E.	12
25	53 03 N.	166 42 E.	8
26	53 17 N.	168 37 E.	11

Extract of sealing log of the British schooner Genera, William O'Leary, master, for the summer season of 1893.

[From Venning's report.]

Date.	Latitude.	Longitude.	Seals.
1893.	° ′	° ′	
July 23	53 17 N.	167 27 E.	7
25	53 30 N.	166 21 E.	22
Aug. 1	53 18 N.	167 04 E.	53
5	53 28 N.	166 10 E.	19
8	53 24 N.	167 12 E.	5
10	53 27 N.	166 03 E.	12
11	53 31 N.	165 58 E.	37
12	53 25 N.	165 47 E.	43
13	53 29 N.	165 36 E.	4
14	53 50 N.	165 33 E.	20
16	53 35 N.	166 34 E.	20
17	53 38 N.	166 41 E.	28
18	53 47 N.	165 01 E.	2
19	53 49 N.	165 49 E.	62
21	54 06 N.	165 46 E.	34
22	54 08 N.	165 40 E.	51
24	53 38 N.	165 31 E.	15
26	53 29 N.	166 01 E.	13

Extract of sealing log of the British schooner Ainoko, George Heater, master, for the summer season of 1893.

[From Venning's report.]

Date.	Latitude.	Longitude.	Seals.
1893.	° ′	° ′	
July 12	53 43 N.	166 00 E.	1
13	53 43 N.	166 00 E.	10
14	53 43 N.	165 45 E.	5
16 *a*	53 43 N.	165 44 E.	30
22			
Total			46

a Schooner's papers seized by the *Yakut* and schooner ordered to Yokohama.

Extract of sealing log of the British schooner Sapphire, William Cox, master, for the summer season of 1893.

[From Venning's report.]

Date.	Latitude.	Longitude.	Seals.
1893.	° ′	° ′	
July 14	52 42 N.	165 08 E.	5
16	52 47 N.	165 29 E.	3
18	53 28 N.	164 57 E.	1
21	53 19 N.	166 44 E.	11
27	53 00 N.	167 22 E.	14
31	53 13 N.	167 52 E.	36
Aug. 4	53 22 N.	167 46 E.	32
7	53 15 N.	168 55 E.	9
8	53 06 N.	167 55 E.	15
11	53 11 N.	166 24 E.	66
14	53 00 N.	166 06 E.	19
15	53 08 N.	166 16 E.	3
16	53 07 N.	166 13 E.	24
17	53 11 N.	165 58 E.	4
19	53 00 N.	165 29 E.	28
21	52 59 N.	165 28 E.	28
23	53 12 N.	167 24 E.	3
Total			301

Extract of sealing log of the British schooner W. P. Hall, J. B. Brown, master, for the summer season of 1893.

[From Venning's report.]

Date.	Latitude.	Longitude.	Seals.
1893.	° ′	° ′	
July 23	53 15 N.	168 41 E.	7
25	53 27 N.	168 19 E.	7
28	53 26 N.	169 44 E.	3
Aug. 1	53 18 N.	170 13 E.	6
5	53 21 N.	169 02 E.	6
6	53 01 N.	169 22 E.	9
8	52 57 N.	169 53 E.	5
10	52 53 N.	167 44 E.	3
12	53 32 N.	168 27 E.	22
13	53 31 N.	168 00 E.	2
14	53 39 N.	167 51 E.	5
17	53 03 N.	168 00 E.	29
18	53 08 N.	167 57 E.	6
19	53 12 N.	167 44 E.	15
21	52 53 N.	167 15 E.	20
23	52 28 N.	167 29 E.	6
24	52 28 N.	167 27 E.	5
26	53 05 N.	167 16 E.	6
27	52 56 N.	168 02 E.	5
29	52 47 N.	170 03 E.	10
Sept. 1	52 57 N.	169 31 E.	5
11	52 53 N.	170 11 E.	5
12	52 40 N.	169 53 E.	3
16	53 31 N.	168 44 E.	2
Total			192

Extract of sealing log of the British schooner Mermaid, W. H. Whitely, master, for the summer season of 1893.

[From Venning's report.]

Date.		Latitude.	Longitude.	Seals.	Remarks.
1893.		° ′	° ′		
July	23	53 50 N.	166 00 E.	15	
	25	53 00 N.	167 00 E.	11	
	27	53 00 N.	168 00 E.	7	
Aug.	1	53 10 N.	169 00 E.	8	
	8	53 20 N.	167 00 E.	15	
	10			10	Foggy.
	11	53 43 N.	167 30 E.	3	
	12			24	Do.
	14	53 30 N.	167 00 E.	13	
	17	53 20 N.	166 00 E.	20	
	19	53 30 N.	166 00 E.	46	
	21			18	Do.
	22	54 03 N.	166 00 E.	37	
	24	53 30 N.	167 23 E.	14	
	25	53 38 N.	166 00 E.	17	
	26	53 30 N.	165 00 E.	10	
	28	53 36 N.	166 00 E.	11	
	30	53 15 N.	169 00 E.	16	
Sept.	4	53 06 N.	169 10 E.	1	
	5				Started for home.
Total				296	

Extract of sealing log of the British schooner Agnes Macdonald, Melville Cutler, master, for the summer season of 1893.

[From Venning's report.]

Date.		Latitude.	Longitude.	Seals.
1893.		° ′	° ′	
July	25	53 10 N.	167 54 E.	7
	28	53 38 N.	167 05 E.	13
Aug.	1	53 20 N.	167 10 E.	62
	5	53 15 N.	167 40 E.	24
	8	53 10 N.	168 28 E.	11
	13	52 49 N.	167 30 E.	19
	15	53 22 N.	166 45 E.	6
	16	53 23 N.	167 42 E.	27
	17	53 00 N.	168 00 E.	8
	18	53 17 N.	167 45 E.	11
	21	53 02 N.	167 10 E.	31
	22	53 23 N.	166 30 E.	25
	24	53 14 N.	166 25 E.	8
	25	53 11 N.	166 55 E.	3
	26	53 21 N.	166 27 E.	5
	28	52 45 N.	167 40 E.	3
	29	53 05 N.	167 24 E.	24
	30	53 17 N.	167 00 E.	4
	31	53 20 N.	166 45 E.	38
Sept.	1	53 20 N.	167 13 E.	10
	4	53 05 N.	166 20 E.	20
	5	52 40 N.	168 00 E.	5
Total				364

Extract of sealing log of the British schooner Vera, William Shields, master, for the summer season of 1893.

[From Venning's report.]

Date.	Latitude.	Longitude.	Seals.
1893.	° ′	° ′	
July 23	53 37 N.	167 20 E.	18
25	53 41 N.	167 19 E.	7
28			16
29	53 23 N.	167 54 E.	3
Aug. 1	53 17 N.	168 08 E.	43
5	52 57 N.	168 09 E.	12
Total			99

Extract of sealing log of the British schooner Sadie Turpel, Charles Leblanc, master, for the summer season of 1893.

[From Venning's report.]

Date.	Latitude.	Longitude.	Seals.
1893.	° ′	° ′	
July 21	53 40 N.	166 40 E.	1
25	53 23 N.	167 29 E.	11
27	53 34 N.	167 40 E.	4
28	53 40 N.	167 35 E.	5
Aug. 1	53 27 N.	168 34 E.	23
5	53 24 N.	167 55 E.	9
8	56 07 N.	168 30 E.	3
9	56 32 N.	168 15 E.	49
10	56 40 N.	168 20 E.	21
11	56 24 N.	168 30 E.	13
12	56 19 N.	167 12 E.	44
16	56 22 N.	167 10 E.	7
17	56 30 N.	167 36 E.	19
18	56 20 N.	167 40 E.	17
19	56 30 N.	167 05 E.	31
20	56 37 N.	167 00 E.	57
21	56 22 N.	167 10 E.	33
22	56 30 N.	167 30 E.	15
23	56 20 N.	166 20 E.	1
24	55 05 N.	164 10 E.	18
25	54 35 N.	164 20 E.	1
26	53 50 N.	164 40 E.	2
27	53 05 N.	165 30 E.	6
29	53 20 N.	167 31 E.	9
31	53 12 N.	168 19 E.	22
Sept. 1	53 10 N.	168 24 E.	3
Total			424

Extract of sealing log of the American schooner Penelope, P. L. Larsen, master, for the summer season of 1895.

Date.	Latitude.	Longitude.	Number of seals.		
			Male.	Female.	Total.
1895.	° ′	° ′			
July 15	53 43 N.	166 29 E.			2
16	53 46 N.	166 40 E.			14
20	53 32 N.	165 43 E.			1
28	54 44 N.	170 54 E.			6
29	54 40 N.	170 50 E.			7
31	54 45 N.	170 30 E.			12
Aug. 2	54 46 N	170 35 E.			8
3	55 03 N.	170 40 E.			1
8	54 59 N.	170 50 E.			4
9	54 18 N.	170 30 E.			1
16	53 50 N.	166 02 E.			22
17	53 43 N.	165 31 E.			15
20	53 26 N.	166 19 E.			3
21	53 43 N.	165 48 E.			1
28	47 37 N	172 00 E.			4
Total					101

Extract of sealing log of the American schooner Golden Fleece, Capt. P. Hansen, master, for the summer season of 1895.

[Kindly furnished by the captain.]

Date.	Latitude.	Longitude.	Number of seals taken.		
			Male.	Female.	Total.
1895.	° ′	° ′			
June 18	42 00 N.	142 28 E.	3	7	10
22	42 35 N.	147 43 E.	1	2	3
23	42 36 N.	147 40 E.	1	7	8
July 3	46 28 N.	156 08 E.	1	2	3
7	53 09 N.	162 55 E.	1	2	3
8	53 34 N.	162 30 E.	2	6	8
15	56 13 N.	164 35 E.	6	18	24
16	56 07 N.	164 04 E.	....	13	13
17	56 21 N.	164 32 E.	3	4	7
27	56 30 N.	164 50 E.	1	2	3
29	56 32 N.	164 45 E.	3	10	13
30	57 53 N.	164 22 E.	5	8	13
31	57 32 N.	164 25 E.	20	35	55
Aug. 1	57 31 N.	164 27 E.	5	20	25
4	57 30 N.	164 20 E.	2	6	8
5	57 29 N.	164 22 E.	10	18	28
6	57 30 N.	164 23 E.	2	8	10
7	57 40 N.	164 30 E.	3	4	7
8	57 50 N.	164 30 E.	1	3	4
10	57 37 N.	164 02 E.	7	15	22
11	57 36 N.	164 05 E.	12	16	28
12	57 30 N.	164 10 E.	7	25	32
13	57 30 N.	164 11 E.	5	15	20
16	57 40 N.	164 20 E.	2	4	6
20	57 45 N.	164 22 E.	14	20	34
21	57 42 N.	164 20 E.	6	6	12
26	57 40 N.	164 30 E.	3	10	13
30	55 00 N.	164 00 E.	3	7	10
Sept. 1	52 47 N.	162 46 E.	2	....	2
3	51 37 N.	161 25 E.	4	....	4
Total	....	....	135	293	428

Extract of sealing log of the American schooner Golden Fleece, Capt. E. W. Funcke, master, for the summer season of 1896.

[From the Official Sealing Log.]

Date.	Latitude.	Longitude.	Number of seals taken.			Remarks.
			Males.	Females.	Total.	
1896.	° ′	° ′				
July 24	56 27 N.	165 28 E.	....	....	....	3 seen.
25	57 30 N.	166 04 E.	....	1	1	2 shot at (9 seen).
26	57 00 N.	166 03 E.	1	2	3	4 shot at.
27	57 04 N.	166 09 E.	2	[a] 12	14	17 shot at (40 seen).
29	56 39 N.	165 58 E.	....	1	1	1 shot at (5 seen).
30	56 54 N.	166 10 E.	3	42	45	60 shot at (90 seen).
31	57 09 N.	166 10 E.	2	7	9	12 shot at.
Aug. 1	57 12 N.	166 09 E.	4	37	41	55 shot at (70 seen).
4	57 05 N.	165 25 E.	....	....	....	1 shot at.
5	57 04 N.	165 12 E.	1	....	1	2 shot at.
9	57 22 N.	163 58 E.	3	17	20	25 shot at (30 seen).
10	57 25 N.	164 10 E.	2	10	12	14 shot at (16 seen).
11	57 06 N.	164 10 E.	6	33	39	45 shot at (45 seen).
12	57 01 N.	164 32 E.	1	2	3	4 shot at (6 seen).
15	56 45 N.	164 37 E.	1	7	8	9 shot at (12 seen).
16	56 58 N.	163 50 E.	....	1	1	1 shot at.
18	56 54 N.	164 12 E.	....	2	2	2 shot at (6 seen).
21	56 27 N.	164 45 E.	....	....	....	3 seen.
22	56 23 N.	164 11 E.	3	8	11	14 shot at (20 seen).
23	56 18 N.	163 58 E.	13	34	47	60 shot at (70 seen).
24	56 14 N.	164 04 E.	5	16	21	25 shot at (30 seen).
25	56 04 N.	164 30 E.	2	4	6	6 shot at (7 seen).
27	55 30 N.	163 00 E.	2	....	2	2 shot at (2 seen).
30	54 00 N.	166 [b] 00 E.	3	7	10	12 shot at (16 seen).
Sept. 6	46 33 N.	153 [c] 51 E.	[d] 1	....	1	Anchored Yokohama, 17th.
Total	....	....	55	243	398	393 shot at.

[a] The female seals all had delivered their pups.

[b] Bering Island in sight, bearing N., distance, 45 miles.

[c] Sighted Simusir.

[d] Young male speared.

Extract of sealing log of the American schooner Silver Fleece, Capt. W. Thompson, master, for the summer season of 1896.

[From an abstract of the log by Mr. H. C. Fassett.]

Date.	Latitude.	Longitude.	No. of seals.	Remarks.
1896.	° ′	° ′		
July 14	.....	.....	.....	C. Kamchatka, W. by N. ½ N. 25 m.; lowered 2 hours; no seals.
20	.....	.....	.....	C. Stolbovoi, W. 20′; boats out one-half day.
27	57 20 N.	163 45 E.	1	
29	57 10 N.	164 00 E.	5	
31	58 00 N.	164 02 E.	1	
Aug. 1	58 25 N.	164 00 E.	2	
2	.....	.....	.....	S. end Karaginski, W. 12′; boats out; no seals.
6	58 17 N.	164 35 E.	.....	Boats out all day; no seals.
7	58 00 N.	164 15 E.	1	
9	57 07 N.	164 00 E.	7	Boats out all day.
10	57 11 N.	164 05 E.	2	Hunted all day.
12	56 50 N.	163 30 E.	2	
14	56 33 N.	164 20 E.	4	
15	56 34 N.	164 30 E.	1	Do.
18	56 10 N.	166 45 E.	5	
22	56 15 N.	166 30 E.	12	
23	56 14 N.	166 00 E.	29	
24	56 20 N.	166 00 E.	15	
29	56 21 N.	166 00 E.	7	Hunted till noon.
Sept. 1	56 54 N.	164 37 E.	2	Do.
2	56 50 N.	164 21 E.	27	
3	57 04 N.	164 25 E.	46	
4	57 03 N.	164 10 E.	3	
6	57 02 N.	165 01 E.	10	
7	57 01 N.	165 00 E.	30	
8	57 00 N.	165 05 E.	26	
11	56 57 N.	163 65 E.	.....	Hunted till 3 p. m.; no seals; arrived Yokohama Oct. 9.
Total	.....	.....	238	

Extract of sealing log of the Japanese schooner Third Chishima Maru, Capt. P. Hansen, master, for the summer season of 1896.

[Kindly furnished by the captain.]

Date.	Latitude.	Longitude.	Number of seals taken.		
			Males.	Females.	Total.
1896.	° ′	° ′			
July 29	57 12 N.	163 42 E.	.....	9	9
30	57 15 N.	163 50 E.	1	5	6
31	57 20 N.	163 55 E.	.....	4	4
Aug. 1	57 35 N.	163 57 E.	.....	2	2
4	58 00 N.	164 00 E.	1	.....	1
7	57 42 N.	164 10 E.	.....	3	3
9	57 12 N.	164 15 E.	2	9	11
11	57 10 N.	164 22 E.	3	14	17
13	56 29 N.	164 47 E.	1	.....	1
15	56 32 N.	164 42 E.	3	6	9
18	56 29 N.	164 57 E.	2	7	9
22	56 19 N.	165 33 E.	1	3	4
23	56 25 N.	165 32 E.	12	26	38
24	56 24 N.	165 32 E.	5	14	19
25	56 29 N.	165 35 E.	1	2	3
29	56 24 N.	165 16 E.	1	3	4
30	56 10 N.	164 20 E.	1	2	3
Sept. 1	54 37 N.	163 42 E.	1	.....	1
2	54 38 N.	164 03 E.	5	.....	5
3	54 08 N.	164 16 E.	1	.....	1
Total	.....	.....	41	109	150

Extract of sealing log of the Japanese schooner Kaiwa Maru, of Hakodate, for the summer season of 1896.

[From the official report to the imperial fisheries bureau, Tokyo.]

Date.	Latitude.	Longitude.	Seals.
1896.	° '	° '	
July 18	54 00 N.	168 53 E.	2
19 to Aug. 7	No position.		21
Aug. 10	55 43 N.	168 01 E.	24
11 to 12	No position.		30
13 to 23	No position.		3
24	56 09 N.	165 47 E.	33
25 to Sept. 1	No position.		4
Sept. 2	56 05 N.	164 41 E.	18
3	No position.		14
4 to 6	No position.		3
7	56 32 N.	166 15 E.	26
8	No position.		35
9	No position.		2
Total			215

NOTE.—The total number of seals taken is stated in the report to be 234, but only 215 are accounted for in the copy of the log as above.

Extract of sealing log of the American schooner Elsie, sealing off the Commander Islands, for the summer season of 1896.

Date.	Latitude.	Longitude.	Number of seals taken.		
			Males.	Females.	Total.
1896.	° '	° '			
July 29	57 16 N.	163 49 E.		3	3
30	56 12 N.	165 19 E.	2	26	28
31	56 12 N.	165 19 E.	4	13	17
Aug. 1	56 16 N.	165 14 E.	11	40	51
5	57 20 N.	164 43 E.		1	1
6	56 02 N.	164 00 E.		5	5
7	56 39 N.	165 24 E.		8	8
8	56 30 N.	166 16 E.		1	1
9	56 37 N.	166 08 E.	1	10	11
10	56 23 N.	166 26 E.	3	35	38
11	56 19 N.	00 00 E.	9	54	63
15	56 31 N.	166 02 E.		3	3
18	56 44 N.	167 07 E.	2	7	9
22	53 25 N.	169 15 E.	1	2	3
23	53 14 N.	168 10 E.	4	5	9
24	53 33 N.	166 45 E.	7	8	15
28	53 19 N.	167 00 E.	1	4	5
Total			45	225	270

Extract of sealing log of the American schooner Golden Fleece, E. W. Funcke, master, for the summer season of 1897.

[From the Official Sealing Log.]

Date.	Latitude.	Longitude.	Seals.				
			Seen.	Shot at.	Taken.		
					Males.	Females.	Total.
1897.	° ′	° ′					
July 25	53 50 N.	163 30 E.				4	4
26	54 39 N.	163 59 E.			2	1	3
27	54 28 N.	163 38 E.			1	8	9
28	54 38 N.	164 28 E.			1	1	2
29	55 38 N.	164 30 E.			1		1
30	56 04 N.	165 45 E.			3	12	15
31	56 08 N.	165 40 E.			2	2	4
Aug. 1	56 50 N.	166 05 E.			1		1
2	56 36 N.	165 40 E.		20	3	14	17
3	56 40 N.	165 50 E.			5	21	26
4	56 30 N.	165 10 E.			8	29	37
6	56 14 N.	165 20 E.			4	26	30
8	56 11 N.	165 50 E.			1		1
11	56 29 N.	166 16 E.			2	3	5
13	56 28 N.	167 00 E.			3	15	18
16	56 32 N.	166 30 E.			5	18	23
19	56 32 N.	167 03 E.			3	15	18
21	57 03 N.	165 32 E.				3	3
22	56 39 N.	166 20 E.				3	3
23	56 53 N.	166 48 E.			1	3	4
24	56 04 N.	166 49 E.			1	2	3
25	56 10 N.	166 18 E.			1		1
26	56 52 N.	165 20 E.			1	4	5
31	56 54 N.	163 50 E.			1	1	2
Sept. 2	57 03 N.	164 48 E.			1	1	2
8	54 20 N.	161 03 E.			1	2	3
9	54 20 N.	161 00 E.			2	8	10
10	54 14 N.	160 56 E.			4	18	22
12	53 46 N.	160 10 E.			1	2	3
19	54 20 N.	161 00 E.				2	2
21	54 11 N.	160 52 E.			2	3	5
22	54 00 N.	160 51 E.			1	1	2
Oct. 21	Anchored Miako Harbor, Japan.						
Nov. 1	Anchored Yokohama, Japan.						
Total					62	222	284

V.—COMPARATIVE STUDY OF THE CONDITIONS OF THE SEALING INDUSTRY ON THE PRIBILOF ISLANDS AND ON THE COMMANDER ISLANDS.

INTRODUCTORY REMARKS.

In the first edition of my report upon the Russian Fur-seal Islands (p. 68) I called special attention to the fact that the observations therein set forth were intended only to relate to the conditions found on the Commander Islands. My personal knowledge of the Pribilof Islands was then so insignificant that I did not venture to draw conclusions from the conditions as I knew them on the former group of islands to those obtaining on the latter. In exemplification I mentioned "the fact of the bachelors mixing among the females and the consequent driving of the latter on Bering Island in order to show that there are differences between the conditions there and upon the Pribilof Islands."

It was therefore with special reference to these contrasts that I studied the Pribilof Island rookeries during my stay on St. George and St. Paul in 1896. The following comparison embodies the more essential points of difference in so far as I have been able to discern them. It will be seen that they relate almost exclusively to the physical conditions of the islands and to the sealing industry, for in the life history of the seals I have been unable to discern any difference except in so far as they have been influenced by the different physical conditions.

COMPARISON BETWEEN THE AMERICAN AND RUSSIAN FUR-SEAL ISLANDS.

Beyond the mere facts that the Pribilof group and the Commander group each consist of two main islands with a couple of small outlying islets, and that both are situated in Bering Sea, similarly isolated from other islands and the mainland, and that consequently the Flora and Fauna and weather conditions are of the same *general* description, there is but slight similarity between the two groups. Such conditions as are identical are also shared by nearly all the other islands in the Aleutian chain, while in their differences hardly a greater contrast between the islands of that region can be found than the one which exists between the respective homes of the Alaskan fur seals and their Asiatic relatives.

With regard to the topography it may be well to remember that the Commander Islands are not only many times larger than the Pribilofs, but that they also rise to a much higher elevation above the level of the sea, the mountains of the former exceeding 2,000 feet while the highest altitude on the latter is about 1,000 feet. It is not necessary to go into a detailed comparison of their geographical features except such as relate directly to the seal life and the conditions of the rookeries.

It is not necessary to enter upon a comparison of the *climatic conditions* of the Pribilofs and the Commanders, as the subject is already covered in my report upon the latter (Russ. Fur Seal Isl., p. 18), and no additional material has come to hand since then.

THE SEAL ROOKERIES AND THE DRIVEWAYS.

The location of the rookeries on the American and Russian seal islands offers one very curious contrast. On the Pribilofs the rookeries are distributed pretty nearly on all sides. On the Commander Islands, however, which trend northwest and southeast, the seals are not found, and apparently never were found on the northeast side of the islands. The explanation is not obvious, for there are plenty of localities admirably adapted for rookeries on the eastern shore of both islands. It may possibly be due to the fact that the migrating seals approach the islands from southern and western sides only, and that because of the greater extent of these islands and their elongated shape there has never been any need for them to extend their territory to the opposite side of the islands, the seal herds being approximately in equilibrium and not increasing in number at the time of the discovery of the rookeries by man. On the Pribilof Islands the conditions at that period were very different, inasmuch as nearly all the available coast line, which is much smaller than that of the Commander Islands, was occupied by the seals, which were probably more than twice as numerous as on the Commanders.

In comparing the nature of the rookeries of the Pribilof Islands with those of the Commanders there was one point which struck me rather forcibly, viz, the lack of sheltered places on the former where the young seals have to learn to swim. There are no shallow bays behind sheltering rocks, nor places protected by submerged long reefs breaking the force of the swell and surf; no place like the bay behind Sivutchi Kamen on north rookery, Bering Island, or the reefs and rocks at Polujimoye Karabelnoye, and Glinka.

The *north rookery* of Bering Island most nearly resembles the Reef rookery on St. Paul so far as its physical characteristics are concerned, though in reality there is no exact counterpart on the latter island. The chief difference lies in the fact that the main portion of the rookery has a much more extended shore line in proportion to its land line, and that consequently it is more difficult to cut out the seals to be driven without a large number escaping into the sea. The sea-lion rocks of both rookeries are fairly comparable, as both serve as a reserve retreat for many males, who thus escape slaughter to grow up to become bulls, though from its smaller size and greater accessibility the one on Bering Island answers that purpose to a less extent.

The Bering Island *south rookery* is again so small and isolated as to have no parallel in the other islands. Its topographical features, however, are by no means peculiar.

The rookeries on Copper Island, again, both the *Karabelni* and the *Glinka* rookeries, are as different from either the Pribilof Island rookeries and those on Bering Island as they can be. Knowing the rookeries of St. George Island, as I did, only from description, I was led to believe that they would compare with those of Copper Island; but my visit to the former island this summer (1896) has shown me my mistake. True, some of the St. George rookeries are situated at the foot of steep bluffs, but in this they do not differ materially from some of the St. Paul rookeries, while on the other hand the cliffs on Copper Island, which rise above the rookery beach, are many times higher, and the beach itself as a rule narrower, more rugged, and indented by reefs and coves. Moreover, the island, back from the bluffs, bears no comparison. On St. George the driveways over which the seals have to, or had to, travel to the killing grounds are comparatively easy, often over level land, and mostly over good firm ground, the greatest hardship being several low ridges of moss-covered bowlders. On Copper Island, however, the seals have to cross high mountain ridges, varying from 600 to 1,200 feet, climbing hills with slopes of 35° to 45°, and descending or sliding down still steeper declivities. In describing the driveways of Copper Island (Russ. Fur-Seal Islands, pp. 46, 47, 50, 51) and the drives themselves (op. cit., pp. 72–74), I was particularly careful not to overstate the facts, in order not to lay myself open to an accusation for exaggeration, since I was going to use the much greater hardship of the seals as an argument against the opinion which blamed the overdriving for the decrease of the seals. Partly deterred by the example of an earlier writer on similar matters, I abstained as much as possible from expressions which might seem to be sensational, preferring to let the reader get his impressions from the photographs of the driveways and from the map of the Glinka rookeries (pls. xiii and xiv), on which, for that very purpose, I had gone to the trouble of sketching in the altitude curves. Nevertheless, here is what I concluded then (op. cit., p. 74):

> The above descriptions give a fair idea of the drives on Copper Island as they were and as they are. They demonstrate the tremendous difficulties and the hardships of the seals. A glance at the maps of the Copper Island rookeries, and a study of the descriptions I have given of them, must convince anybody that there is nothing even approaching them on the Pribilofs.

This was written at a time when I imagined the St. George Island drives to be quite severe. After having seen the routes of the latter it is possible to emphasize the terrible character of the Copper Island drives still more, and to affirm most positively that the severest drive on the Pribilofs is only child's play compared with those over the ragged mountains and the slippery, clayey sides of the Russian islands.

Here is an abstract from my diary, St. George Island, July 9, 1896, which shows the impressions of the worst Pribilof Island drive as written down at once:

> Visited the Stari Artil rookery in the afternoon to get an idea of the drive, which is said to be the hardest on the islands. It is about 2 miles long, but mostly over mossy ground, and if the seals are driven with care the drive can not be considered a hard one. There are no particularly steep or difficult places, and the hauling ground is practically level with the driveway. St. George being a comparatively rocky island, I had got the idea that the drives were on the same order as those of Copper Island, but nothing could be more removed from the actual facts. Most of the drive is over a springy, soft sphagnum plateau, only in a couple of places interrupted by narrow, low ridges of lava bowlders, but the interstices between these are filled with humus and vegetation and the passage over them is comparatively easy.
>
> The hauling grounds of the bachelors are so favorably situated in the rear of the rookeries and high up on the slopes or plateaus that there are no difficult places to drive them up from the beaches, as on Copper Island. As a matter of sober fact, there is not a single drive on Copper Island which is as easy as the worst on St. George Island, except those few where the seals are killed on the west side just back of the rookeries.

When I described the Commander Island drives I was familiar with them only; what I knew of the Pribilofs was chiefly from the exaggerated descriptions of others. Dr. Jordan, who first saw the drives on the latter, was naturally much more vividly impressed by the enormity of the Copper Island drives, which he witnessed later. To complete the comparison and strengthen the picture, it is therefore interesting to append his notes of his experience August 25, 1896, which are to the following effect:

> The drive [from Palata, Glinka, Copper Island] ascends from the parade ground on the top of the land spit. This was formerly occupied by bachelors, but there are no separate droves of bachelors now; they are scattered in little clumps about and between the rookeries.
>
> The drive then goes up about 100 feet of grassy cliff, so steep that steps have been dug; then follows some 700 feet of irregular but very steep slope, in which the easiest depressions are sought. though it is everywhere about as steep as a man can climb, and one who goes up it clings to the grass, This brings them to the back of the knifelike ridge that separates Palata from Zapalata. This widens out into an easy level plateau for about 20 rods, marked with road skeletons. This is 850 feet high on Stejneger's map.
>
> Then follows a steep climb up gravel and clay, with scanty grass and heather, worn into steps, the driveway bounded on the southwest by a slanting precipice that lies above Sabatcha Dira. Then comes a steep shoulder of heather and small plants, followed by a final climb into the clouds to the summit of the pass, 1,190 feet above the sea.
>
> Then comes an abrupt descent, with a zigzag trail of 500 feet, as steep as a horse could go over, with gravel and low flowers, to the bed of a swift little brook. This flows down into a grassy basin, the slope becoming less and less, the rye grass and putchki growing smaller. The stream flowing into the little brook to the west merges this drive into the one from Zapadni.
>
> This drive is not in any place so difficult as the gully just above Zapadni, but it is half higher and twice as long, a trip one could not take on horseback, nor would it be easy to lead a horse over it. Comparing it with St. Paul, the Palata Pass is as steep as the cone of Bogoslof, twice as high, and without water. Compared with the severest drive on St. Paul, it would stand as the ascent of Mount Blanc to a walk in the park. It is a very fatiguing trip for a man. It took me, walking rapidly, thirty-eight minutes, deducting stops, from Palata to the grassy level, 860 feet; thence twenty-eight minutes to the top, 1,190 feet; fifteen minutes down the upper slope, and fifteen more to Glinka.
>
> Stejneger's account is very correct, but it left me with no adequate idea of the rough way in which seals under the harsh Russian régime are forced to carry their skins to the slaughter.

METHODS OF DRIVING.

Some of the differences in the methods of driving have already been pointed out by me (Russ. Fur-Seal Islands, p. 97), notably the driving of seals in large bodies on the Pribilofs instead of in small detached pods, as on the Commanders (pl. 77), and to illustrate the points I gave detailed descriptions of various drives on both the American and Russian islands. To complete the record I will add the notes I made on the spot concerning a drive on St. Paul Island July 15, 1896, during which I was again impressed with the superiority of the Russian method of driving:

> The drive from the Reef to the killing grounds north of the village lake was a short and comparatively easy one, although the weather was not particularly favorable (no wind, and temperature +43° F.). It lasted about two hours, and the men were not hurrying the seals unduly. As a result, none were overheated or lost by the wayside. The whole herd from the Reef, after having been driven some distance, was divided into two divisions, which were driven separately, but no further subdivision was attempted and would hardly have been practicable with the 15 men of which the driving gang consisted. This resulted in a great deal of unnecessary worry and panic. There is no excuse for this, as there are enough men and boys on the island to properly man the drive, and there seems to be no good reason why the skinning gang, now only appearing at a later stage, should not also partake in the driving. This is another difference from the system on the Commander Islands. Here, on the Pribilofs, as soon as the killing gang have clubbed the first pod, the stabbers and rippers (in the present case 5 young natives) begin to stab the prostrate seals and to cut the skin down the middle of the abdomen, around the ears and flippers. They are followed by the skinning gang, a similar number of older and more experienced men, who finish up the skinning, leaving the skins by the carcasses, to be carted away to the salt house later on.

In the methods of killing, skinning, and curing there seems to be no special difference on the two groups of islands, except with regard to the skinning of the small seals on Copper Island, viz, the habit of skinning the head down to the mouth instead of cutting off the ears. The restriction of the skinning to be done only by experienced skinners, as practiced on the Pribilofs, certainly insures better work and has probably something to do with the better price obtained for the Alaskan skins.

CONDITION OF SEAL LIFE ON THE ROOKERIES.

With regard to the comparative condition of the seal life on the rookeries of the two groups, in so far as I was able to observe it during 1895 and 1896, it may be broadly stated that the condition on Copper Island was quite similar to that of the Pribilof rookeries, i. e., the breeding grounds were thin, the females being few and scattered over the whole length of the rookery, with breaks and gaps in the line here and there, and at the same time a detrimental superabundance of vigorous, fighting bulls, which greatly interfered with the orderly progress of the rookery business. The reason for this condition I have shown to be the pelagic sealing, but on the Pribilof Islands the undesirable abundance of superfluous males is due to the mistaken policy of limiting the number of male seals to be taken and the liberty of the lessees to select only such sizes as best suit their purpose. The same result on Copper Island is caused by the utter inaccessibility of some of the hauling grounds, which renders it impossible to kill the necessary number of males. The remedy on the Pribilofs is obvious, viz, the killing of a greater number of bachelors without rejecting the larger, less desirable skins. On Copper Island it becomes necessary, however, to reduce the superabundance of bulls by killing off a suitable number of old ones, a remedy employed during 1896.

Bering island, north rookery, on the other hand, presents quite a contrast to the condition of the others. Here the reduction of the females (at least up to 1895) has been comparatively insignificant. The breeding grounds have not diminished nearly to the same extent as those on Copper Island and the Pribilofs, nor do the females appear to have been thinned out on the area occupied. As a result the proportion between males and females is very different from what it is on the other islands, there being much fewer bulls in proportion. No competent observer, however, has claimed that there are not enough bulls on this rookery to properly fertilize the females. On the contrary, I convinced myself that the condition of the rookery, so far as the number of pups were concerned, was very good. The complaint of a lack of bulls on Bering Island has an entirely different source. It is not because of dearth of bulls for breeding purposes that the natives complain, but because there are no superfluous old bulls to be killed for their hides. The natives on Bering Island are short of suitable skins for long waterproof leg boots, or tarbassi, especially since the sea lions have nearly all disappeared ; hence these tears.

I have previously pointed out the cause of the better condition of the great Bering Island rookery, viz, the fact that the seals breeding there have been less exposed to the ravages of the pelagic sealers, their feeding grounds to the north and northwest of Bering Island having become known much later than those of the Copper Island seals, and even after their discovery less vigorously exploited.

The Bering Island rookeries present another feature different from those on both Copper Island and the Pribilofs. On these islands the bachelors alone are driven to the killing grounds. Females occasionally get caught in these drives, partly because a few sometimes haul out among the bachelors; partly, and especially on Copper Island, because it is sometimes very difficult on the narrow beaches to drive past the breeding grounds without a few females becoming mixed in. On Bering Island, however, it is necessary to drive off the entire rookery in order to pick out the bachelors from among the females and pups. This is no novel feature due to the decrease of the seals. The same thing took place in 1882 and 1883, during the palmiest days of the seal business, when the condition of the rookeries was at its best, and while the seals were still increasing. Even at that time *numbers of females and pups* were mixed up in the drives. It is quite likely that the *proportionate* number of females was much less in those days, when several times as many bachelors were killed as nowadays, but the driving of females on Bering Island was then as much of a regular feature as it is now. The reason for this necessity lies in the peculiar shape of the Reef rookery. Situated as it is on a long spit with only a narrow base, the breeding seals occupying the water line and the bachelors hauled out behind them, it is impossible to cut the latter off from the water without also cutting off the breeding females. Formerly the rough sorting of the sexes was accomplished easily at the first round-up, and as the drive, divided into small companies, progressed toward the killing grounds, there being no particular anxiety about letting a few bachelors escape with the females. Nowadays, however, when the latter have become scarce it is essential that not a single one be lost, and consequently the females have to go to the killing ground, where a more careful culling can be done in the pods taken out for slaughter.

NUMBER OF SEALS ON THE ISLANDS.

On the Pribilof Islands various attempts have been made during the last twenty-five years to estimate, calculate, or count the number of seals in the rookeries. The vast multitudes hauling out in the seventies and early eighties were evidently so overwhelming that no one seriously suggested a census based upon an actual count. Instead, various methods of estimating and calculating were indulged in, which to my mind were nothing more than guesswork of the worst kind in disguise. My reasons for thinking so I have given elsewhere (Russ. Fur-Seal Isds., p. 105), though with the cautious proviso that while I had found such methods utterly inapplicable on the Commander Islands I would express no opinion as to their adequacy on the Pribilofs. My experience on the latter in 1896 has convinced me, however, that the objections I had raised were equally pertinent on the American as on the Russian side. In 1895, however, the number of seals on St. Paul and St. George had become so decimated and scattered that it appeared to Mr. True and Mr. Townsend to be feasible to count them, at least on some of the rookeries, and during 1896 a census on a similar basis, but more extensive and with the aid of a number of assistants, was successfully undertaken by Dr. Jordan and his associates, as reported by him. I am satisfied that the total arrived at is a very close approximation to the actual number of seals hauled out on the Pribilof breeding grounds. By partaking in this work myself I gained enough experience to form a well-founded opinion concerning the feasibility of a similar census of the Commander Islands, and I must adhere to my former declaration that it can not be done, the nature of the rookeries is so different.

Take first the north rookery on Bering Island. There is no point on shore from which even an approximate count could be made. From the very fact that the bulls located away from the Reef can not be roused, and because of the level nature of the ground, it is not even practicable to get an approximate count of the bulls. Nor could a better result be obtained from a boat, as the surrounding water is too shallow and too full of rocks and reefs to a close enough approach, even if all the seals could be seen from the boat, which they can not.

When inspecting the Karabelni and Glinka rookeries in 1896 I paid special attention to this point, coming, as I did, from the census of the Pribilof herd. At Karabelni it may be possible to get at a fairly good approximation of the number of breeding seals in Bolshaya Bukata, but beyond that it is impracticable. At Glinka it may also be possible to ascertain the numbers in Gavarushkaya, Sikatchinskaya, and Zapalata, but in most other places the probable error will make an attempt at counting completely illusory.

As on the Pribilofs, a few attempts have also been made on the Commander Islands to present figures claiming to represent the number of seals on the rookeries, but the bases for such estimates have been even more unreliable than on the Pribilofs. In the early days it was enough to suppose that inasmuch as the annual yield of skins was about one-half that of the American islands, the total number must also be about one-half; and as, say, 6,000,000 had been given in print as the grand total for the latter, 3,000,000 seals must make their home on the Commander Islands. Of late years the senior overseers at the rookeries have been encouraged to present estimates or counts, but the results, sometimes quite grotesque in their minuteness of detail, are utterly valueless as having no foundations in any tangible facts.

Having carefully gone over the figures of the census of the Pribilof Islands, certainly the nearest approximation to the actual number of seals on any rookeries ever accomplished, and comparing the extent of the Commander Islands rookeries and their condition with those of the Pribilofs as I know them from several years of close inspection, I have endeavored to make as close a guess of the number of seals breeding on the Commanders as I am able to, since there seems to be a desire that I should make such an attempt. At the same time I will state that I do so reluctantly and with the express reservation that I myself regard the approximation as only remote. I wish to apply to this effort Mr. True's words (Rep. Cond. Seal-life Pribil., 1893–1895, pt. II, p. 107) to the effect that "the chief use of such calculations in the present connection is, in my opinion, for the elimination of fanciful estimates of the number of seals. Thus, a statement that there are a million or half a million seals on the islands may safely be disregarded, as may equally any claim that there are but a few thousand remaining."

Estimated number of breeding seals on Commander Islands, 1896.

Bering Island:		
North rookery	30,000	
South rookery	800	
		30,800
Copper Island:		
Karabelni	10,000	
Glinka—		
Urilé	5,000	
Zapadni	3,000	
Sabatcha Dira	700	
Palata	6,000	
Zapalata	4,000	
Sikatchinskaya	3,000	
Gavarushkaya	2,500	
		34,200
Commander Islands, total		65,000

MANAGEMENT OF THE FUR-SEAL INDUSTRY.

There are various differences in the administration of affairs on the American and Russian fur-seal islands, in the relation of the lessees and of the governments to the natives, and the resources of the latter, which it may be instructive and interesting to inquire into.

It may be stated, in a general way, that on the Pribilof Islands, under the contract, the lessees are managing both their own affairs and those of the natives, while the rôle of United States Government officials is chiefly one of supervision, their duty being to see that the lessees are fulfilling the conditions of the contract both in reference to the natives and to the Government. The lessees must furnish the natives with doctors and medicines, must maintain schools, take care of widows and orphans, supply a certain amount of coal, etc. The doctors, school teachers, etc., are therefore employees of the company. They import and sell in their stores such articles and at such prices as they themselves fix upon. They undertake practically the sealing, the killing and selection, and the natives are working for the company.

On the Commander Islands the arrangement is entirely different. There the lessees have practically nothing to do with the natives or with the sealing. The Government furnishes doctors and school teachers, and the community, from its own revenues, takes care of the widows and orphans. The Government undertakes the sealing business itself, attends, by its officials and the natives, to the selecting, killing, and skinning of the seals; all the company has to do is to receive the skins at the salt-house door and to cure them. If the company refuses the skins, well and good, the Government retains them and sells them, the practical result, however, being that the company prefers to take all skins rather than to have them thrown on the market in competition. In their stores the lessees are only allowed to sell such articles as the Government may order, and at a certain fixed percentage over wholesale invoice prices.

It will be seen that the Russian system is greatly superior to that in vogue on the American islands, inasmuch as it keeps the natives away from the control of the company and that it gives the Government a much freer hand in the regulation of the whole sealing business. Superficially it looks as if the American system has worked a saving to the Government, and that the facilities of medical attendance, schools, etc., have been obtained free; but as a matter of fact these items have of course been calculated by the lessees and their equivalent deducted from the price offered for the skins.

In addition to the better system (part of which is also that the contract with the lessees is only for ten years while on the American islands the contract is for twenty years), the Russian Government has also secured for the natives better remuneration both for their work and for their fur-seal skins. Thus, on the Commander Islands, the natives receive per seal skin (in pay for the work of killing and skinning) $0.75 (rbl. 1.50), while on the Pribilof Islands they are only paid $0.50. On the Commander Islands the natives receive $7 (rbl. 14) per skin for first-class blue foxes, while the price on the Pribilofs is only $5.

It must not be forgotten that the Commander Island natives are also better situated so far as the natural resources of their islands are concerned. The Copper Islanders derive great revenue from the large number of sea otters they kill, and on Bering Island the natives have the large salmon fisheries to depend upon. No such sources of income and food are available to the people on the Pribilof Islands.

HYDROGRAPHY AND FEEDING GROUNDS.

The *hydrography* of the two island groups offers several interesting differences which probably influence the distribution of the animal life upon which the seals feed and consequently the distribution of the seals themselves during their stay at the islands.

The Pribilof Islands are situated within a shallow plateau of scarcely 50 fathoms extending toward the north and east to the American continent. The cold waters flowing over this bank are apparently not favorable to the surface forms upon which the seals feed, and the feeding grounds of the Pribilof Island seals are therefore located to the south and west of the islands over very deep water.

The Commander Islands, on the other hand, are surrounded on all sides by very deep water, rising abruptly, as they do, on nearly all sides from a bottom floor 2,000 fathoms and more below the level of the sea, while it is now even doubtful whether any considerably less depth connects them to the Kamchatkan mainland to the northwest. The conditions are here evidently almost equally favorable to the necessary surface life both to the north and to the south of islands, thus giving rise, in connection with the great distance between and different location of the Bering Island rookery and those of Copper Island, to the separate feeding grounds of the seals respectively inhabiting these islands.

When writing my 1895 account of the *feeding grounds* of the Commander Islands Russ. Fur-seal Isl., p. 87) the material at hand was too scanty for a clear demonstration of the existence of separate feeding grounds for the Bering Island seals and those of Copper Island, but it was indicated directly by the catches of several schooners to the north of Bering Island, and indirectly by the lack of catches between the Bering Island rookery and the well established feeding grounds of the Copper Island seals. Another consideration which led me to the same conclusion was the fact that the females had suffered an immense decrease on the Copper Island rookeries, while on the Bering Island north rookery the falling off of the breeding females was comparatively trifling, a condition of affairs which can hardly be reasonably explained under any other supposition.

Since then sufficient log books of sealers have come to hand which show conclusively that the feeding grounds of the Bering Island seals are located to the north and northwest of that island, while the Copper Island seals feed south and southwest of the latter island (pl. 88). The difference from the Pribilof Island feeding grounds is therefore both interesting theoretically, but also highly important practically as showing that the explanation of the comparatively good condition of the Bering Island north rookery was correct, seeing that it is only during the last couple of years that the pelagic sealers have preyed upon the Bering Island feeding grounds to any great extent.

PELAGIC SEALING.

The history of pelagic sealing on the American side and on the Asiatic side is so different, yet the result so identical, that a more detailed comparison seems called for in the present connection.

Pelagic sealing on the American side originated in the seventies and became gradually more and more extensive and important during the early eighties, until in 1886 nearly 40,000 skins were taken by the pelagic sealers. From then the yearly average reached about the same figure until 1891, when it is stated to have been about

62,500. During the closing of Bering Sea, pending the deliberations of the Paris Arbitration Tribunal in 1892 and 1893, the number fell again, only to rise almost to the old figure upon the reopening of the eastern portion of Bering Sea in 1894. At the same time the killing on the Pribilof Islands up to 1890 averaged over 100,000, or more than twice as many as were secured at sea. The condition of the rookeries in the early days being chiefly measured by the yield of bachelor skins, and the pelagic sealing, with its consequent decrease of females on the feeding grounds, being gradual, the full significance of the facts were at first not understood.

On the Asiatic side the state of affairs is entirely different. There pelagic sealers did not begin to prey upon the Commander Islands herd until 1891, and in that year even to a very insignificant extent. In 1892, however, the entire pelagic fleet sailing in Bering Sea came across to the Russian Islands, and on the feedings grounds off Copper Island alone—the capacity of which at its best was hardly one-fourth that of the Pribilof Islands—the sealers took more seals, chiefly females, than they had ever taken around the Pribilofs in any one season, or about 25,000 seals. In 1893 they came again, hunted the Asiatic seals both in their winter quarters and off the islands, securing over 72,000 Commander Islands seals, and in 1894 over 90,000, mostly females, figures nearly twice as large as the largest catches on the American coast off a seal herd more than twice as large. The catches on the Commander Islands at the same time averaged only about 30,000 bachelors.

In other words the *pelagic sealing on the Asiatic side was fully four times as disastrous in proportion to the stock of seals* on the islands compared with the destruction visited on the American seals.

Up to 1891 no one had noted a diminution of the breeding seals on the Commander Islands, but in view of the above figures no one will wonder that when I visited Bering and Copper islands in 1895 the number of female seals had seriously dwindled to a mere fraction of their original numbers. Here was consequently no mistaking either the facts of the decline or the cause of it.

PROTECTIVE MEASURES.

It will be noticed that while the United States and England tried to come to an arrangement for the protection of the American fur seals, the enormous blow was inflicted upon the Russian seal herd. The Russian authorities in St. Petersburg were quick to act, but owing to lack of correct information the regulations agreed to with England for the protection of the Asiatic herd (Russo English Provisional Arrangement of 1893) failed in their purpose even more so than those promulgated by the Paris tribunal.

The chief differences in the regulations for the protection of fur seals on the two sides of the Bering Sea and the Pacific Ocean are as follows:

On the American side the prohibited zone extends 60 miles around the islands; on the Asiatic side the zone is only 30 miles wide. On the American side sealing is prohibited from May 1 to July 31; on the Asiatic side there is no restriction as to season whatever.

While it is true that the time limit as fixed on the American side has not afforded the protection that was expected, yet an examination of the statistics given in my report on the Japanese sealing industry (270) will show conclusively that a good many thousand seals would have been saved to the Asiatic seal herd had sealing been prohibited after May 1. On the Asiatic side the main injury is inflicted to the herd during its migration; the territorial limit without a time limitation has been proved to be utterly valueless, and it can be asserted with confidence that if a sufficient time limit were to be adopted the territorial limit might be done away with entirely.

The third difference between the regulations in American and in Russian waters is that it is forbidden to use firearms for killing the seals in the American portion of Bering Sea, while no such prohibition obtains on the Russian side.

With regard to the proposed branding of the female seals as a protective measure it may be stated that while it is entirely feasible on the Pribilof Islands, the branding can only be accomplished on one of the Commander Islands, viz, on Bering Island. On the two rookeries of this island it would be a very easy undertaking to brand every female pup, while on Copper Island, on account of the inaccessibility of the rookery grounds, the scheme is utterly impossible.

IS A TEMPORARY STOPPAGE OF KILLING ON LAND ADVISABLE?

The propriety of prohibiting the killing of fur seals on land for a period of five years, as a means of building up the seal herd, has of late been discussed by the Russian authorities. The success in former years of such a cessation of killing on land, or "zapuska" as it is called, as well as its advantage in the management of the fox and sea-otter hunt, have undoubtedly influenced them; but they have plainly failed to see the difference between those old zapuskas, which protected the females as well as the males, and the zapuska of the present, the employment of which would only mean the protection of the males alone when on land. When at sea, they would be subjected to the same danger from the pelagic hunter as the females. It shows that they have utterly failed to grasp the two essential points of the seal question as it stands to-day, viz, that the decline of the seal herd is solely due to pelagic sealing, and that the increase and consequent rehabilitation of the herd depends solely upon the preservation of the female seals. If pelagic sealing be stopped, no zapuska is necessary, or, as I shall show, it will be directly hurtful. If pelagic sealing be continued, a zapuska will not only not protect the herd on shore, but it will directly result in increased catches for the pelagic sealers as long as the zapuska lasts, since they will have the additional males to prey upon which will have been spared on land.

Now, the future prosperity of the seal herd depends upon the number of females it contains; the number of bachelors is irrelevant in this connection. Suppose pelagic sealing be suppressed and a five years' zapuska instituted on the Commander Islands: what would result? At the end of the five years there would be exactly as many females as if no zapuska had been, not one more (possibly some less), because no female seals would have been killed even if the zapuska had not been kept. But there certainly would be a great many more killable seals at the beginning of the sixth year than during any one of the preceding years. A little reflection, however, will show that their total number must be less than the total sum of killed during these preceding years, inasmuch as the 2 to 4 years' old bachelors of these years would have escaped the killing and become sikatchi, that is, available rookery bulls, and consequently unfit for killing during the zapuska. And how would it look on the rookeries? Copper Island is already overstocked with bulls to such an extent that it would greatly benefit the herd to decimate them now; with a five years' zapuska the conditions would be infinitely worse. On Bering Island there is no overstocking of males now, but there is nothing to indicate that there are not enough bulls, and five years' prohibition would bring about the same deplorable condition as on Copper Island; in fact, the results would be more disastrous, for the nature of the rookery beach on Bering Island is much less favorable to the pups in protecting them from being trampled to death.

To sum up, a zapuska as contemplated would result in (1) no addition of a single female to the herd; (2) loss in the total number of killables; (3) highly injurious overstocking of the rookeries with fighting males, and (4) a consequent heavy loss of young pups killed shortly after birth.

A zapuska without total stoppage of pelagic sealing would be even more senseless as the females would continue to decrease at a much greater rate than the males, more females than males being killed at sea, and the resultant overstocking of the rookeries with bulls would be even more disproportionate and more disastrous.

That these considerations are not mere fanciful theories is plainly shown by our experience on the Pribilof Islands. As soon as the falling off in the catch of the bachelors called attention to the decrease of the seal herd a halt was called; the killing on land was reduced to a minimum. The temporary officials were then under the same erroneous impression as the Russian authorities now, viz, that the calamity consisted in the decrease of the bachelors, and they overlooked that it was the females, and they only, that needed being looked after. For several years only a fraction of the killable seals was allowed to be taken. What was the result? A single additional female on the rookeries? No; loss to the lessees and the Government of the bachelors spared; a corresponding gain to the pelagic sealers; a deplorable superabundance of bulls on the Pribilof rookeries, and numerous pups trampled to death soon after their birth. America has thus paid very dearly for her blunder. Are the Russians going to repeat it?

It is quite possible that they may quote the example of Robben Island. Thus, in 1891, only 450 skins were taken; then, in 1892, none; but in 1893, 1,500. Apart from the fact that raiding on land took place, I will only call attention to the fact that until within the last couple of years the killing on Robben Island was not so rigidly restricted to the males as is usual on the other rookeries.

Finally, it may be said against me that I have formerly favored a "total prohibition of killing on land one year."[1] It must be remembered that the recommendation in question was penned in 1895. At that time the number of males on Bering Island was more disproportionate than at present; consequently it seemed more desirable to increase the number of bulls. At that time we did not have the experience from the south rookery, which shows that a much smaller number of males is sufficient than has hitherto been held possible.

I may add that the recommendation was made upon the supposition of a temporary suspension of pelagic sealing only, and that it was thought necessary to make some such concession to the pelagic sealer in order to obtain this suspension. Since 1895 we have learned a great deal, and progress is only possible if we recognize and renounce our past mistakes.

It can now be asserted with certainty that a zapuska of five years, or of one year, will retard the rehabilitation of the rookeries not only for so many years as the zapuska lasts, but until the blunder be corrected by a wholesale killing off of the superfluous bulls resulting at the end of the zapuska.

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[1] Russian Fur-Seal Islands, p. 136.

VI.—CONCLUSIONS.

SUMMARY.

To gain a clear understanding of the fur-seal question, in so far as it relates to the Russian Seal Islands, it may be well to sum up the essential points as follows:

The topographical character of the rookeries on Bering Island and on Copper Island are essentially different. On the former the grounds are low and accessible, and the drives are unusually easy, involving but little hardship on the seals, even compared with the rookeries on St. Paul Island, Pribilof group. On Copper Island, however, the rookeries are situated at the base of high precipices, very difficult of access, and the drives, from the mountainous nature of the island, are as harsh and trying as it is possible to imagine.

Notwithstanding this difference in the topography, the conditions of seal life on the rookeries were practically alike on both islands previous to, during, and some time after my first visit to the islands in 1882–83. It is an indisputable fact that the seals were increasing markedly in number during that period on both islands.

Of late years the seals have been rapidly decreasing on both islands, the decrease corresponding to the same phenomenon on the Pribilof Islands, but taking place proportionately about five years later on an average.

When I again visited the islands, in 1895, I found the conditions of seal life on the rookeries had so changed as to radically differ on the two islands. On Bering Island, in addition to a marked decrease in killables, there was a notable scarcity of old bulls, while the decrease in breeding females was less apparent. On Copper Island, while the number of killables was small, sexually mature male seals were, on the contrary, plentiful, and at the same time the number of females had decreased enormously.

Prior to 1892 the Commander Islands seals had suffered but little from pelagic sealing in general and practically nothing from preying upon the feeding grounds of the female seals, at the very time when the Pribilof Island sealing grounds were being rapidly exhausted.

Since 1892 the whole body of the pelagic sealing fleet has preyed, during the most precarious season of seal life, largely upon the female seals visiting the feeding grounds off Copper Island.

An unusual mortality of starving seal pups has not been observed until last year on Bering Island, but the natural conditions of the Copper Island rookeries are such as to make it easy to overlook such a fact.

The 30-mile zone stipulated in the Russian-British arrangement of 1893 has only put a stop to the raiding of the rookeries, but has been found utterly valueless as a protective measure against pelagic sealing.

The rookeries of the Commander Islands will become exhausted within a few years if the present conditions are allowed to continue much longer.

CAUSES OF THE DECREASE.

Three different causes, either of them alone, or in combination with the others, have been generally regarded[1] as responsible for the undeniable decline of seal life on the seal islands of the Bering Sea and North Pacific Ocean, viz, excessive driving of the male seals, raids on the rookeries, and pelagic sealing. It may be well to inquire how each of these alleged causes applies to the conditions prevailing on the Russian islands.

It has been claimed that the *driving* of the male seals results in sapping their vitality and impairing their procreative powers, thus causing a double decline by shortening the life of the individual and causing a smaller number of pups to be born. I have elsewhere in this report discussed this question. Here it will suffice to simply inquire, How do the facts observed on the Commander Islands agree with this theory? I have already summarized the facts, but they will bear a brief repetition. On Bering Island the driving is so easy that even the black pups driven in flocks with the adults are uninjured; yet there was quite a deficiency in bulls, virile and otherwise. On Copper Island the drives are beyond comparison the hardest known anywhere; yet there was a surplus of exceedingly virile bulls; and still, if we may be allowed a comparison with the Pribilof Islands, we may add that the decrease in killables on Copper Island is of a much later date than the corresponding decrease on the Pribilofs. Now, if the driving had had the slightest influence upon the numbers of the seals, how did it happen that the seals were increasing while it is a fact that the drives have never been easier, but if anything rather harsher? Nothing seems more clear and logical than this proposition, viz, that if the driving is the cause of the decline, we should expect the falling off in bulls to have taken place on Copper Island, and not on Bering Island; but the reverse is just the case. I am, therefore, compelled to absolve the driving of the responsibilty for the decrease on the Commander Islands.

The contention that the occasional *raids* practiced on the rookeries by marauding schooners are materially to blame for the decrease has found but slight support, and the experience on the Commander Islands does not substantiate it. I have shown that the Commander Islands seals were increasing in spite of the numerous raids in the early eighties; I have also shown how the little rock of Robben Island has continued to yield killable seals in spite of an unparalleled history of raids. It is safe to say that the annual catch of the raiders of the latter island greatly exceeded that of the legitimate killing on shore,[2] and yet the falling off in the yield is not greater than that of the other islands.

There remains the *pelagic sealing*. Up to 1892 their was no startling decrease of the female seals on the Commander Islands rookeries, while there had been for a couple of years some difficulty in getting the former number of killables. In 1892 the sudden invasion of the whole body of the pelagic sealing fleet upon the unprotected feeding grounds of the Copper Island female seals took place, followed by similar inroads in

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[1] For the theory of overkilling of males, as now advocated chiefly by Mr. Barrett-Hamilton, see ante, pp. 180–182.

[2] The catches of the schooners which are known to have raided Robben Island from 1878 to 1895, together with other illegitimate losses, amount to about 53,000 skins. The total number of skins taken by the lessees during the same period is a little over 33,000. The proportion is therefore as 5 to 3.

1893 and 1894. The melancholy decimation of the female seals on the Copper Island rookeries, as witnessed by me in 1895, can be directly traced to this preying upon the herd off Copper Island. The extension of the hunt to the Bering Island feeding grounds in 1895 explains easily the presence in great numbers of pups starved to death on the Bering Island rookery. The somewhat earlier falling off in killables is attributable to the increase in the winter and spring catch off Japan.

The simultaneous or sequential occurrence of the above facts and phenomena is evidently more than a mere coincidence. As cause and result, they fit like a hand in a glove, and *I have been unable to resist the force of the logic which places the blame for the decrease of the Commander Islands seals upon pelagic sealing, and upon pelagic sealing alone.*

FUTURE PROSPECTS ON THE COMMANDER ISLANDS.

The Commander Islands seal herd, originally and at its best less than half the numerical strength of the Pribilof herd, is being killed off so rapidly that in a season or two it must become utterly unprofitable to hunt them in the open sea. If the destruction is allowed to go on much further it is feared that it will take a very long time before the rookeries can be to any degree restored, even under the most effective protection.

If, on the other hand, really protective measures could at once be instituted, I am of the opinion that it will be possible to repair the damage within a reasonable time. It may not be possible to bring back the palmy days of 50,000 skins a year,[1] but it might yet be feasible to render the business profitable to the natives, the Government, and the fur trade.

This may to many appear as a rather optimistic view, but I base my opinion on the well-established fact of the quick recovery and rapid replenishing of the rookeries during the beginning of the lease of Hutchinson, Kohl, Philippeus & Co., as well as upon the wonderfully recuperative powers of the herd as demonstrated in the history of Robben Island. A graphic demonstration of an estimated increase would bear out this opinion, but as being chiefly speculatory, and therefore outside the limits which I have endeavored to keep in this report, is here left out of consideration.

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[1] Unless pelagic sealing were to be absolutely and totally suppressed, in which case there is no reason why the old prosperity should not return at a similar rate as during the years following 1871.

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B.—THE KURIL FUR-SEAL ISLANDS AND THE FUR-SEAL INDUSTRY OF JAPAN.

I.—INTRODUCTION.

With a view to setting at rest the many vague rumors of large catches of fur seals in the Kurils during recent years and the equally unfounded theories based thereon of the formation of new rookeries, and, on the whole, in order to get at all the facts connected with the fur-seal industry in the North Pacific, the Fifty-third Congress was asked to authorize an investigation of the Kuril Island fur-seal rookeries in connection with the contemplated examination of the Pribilof and Commander Island rookeries. The authority being granted on June 8, 1896, the present writer was detailed on the following day by the President of the United States to undertake the investigation, for which purpose he was later on attached to the new Bering Sea Commission, of which Dr. David S. Jordan, president of the Leland Stanford Junior University, in the meantime had been made president.

ITINERARY.

Leaving Washington, D.C., on June 18, I joined the United States Fish Commission steamer *Albatross*, Capt. Jeff. F. Moser, which was placed at the disposition of Dr. Jordan and his assistants, at Seattle, on June 24. On July 8 we arrived at St. George Island, Pribilof group, and with the rest of the commission, as well as the British and Canadian commissioners, I examined the rookeries of the Pribilof Islands until July 19. Having by that time finished the necessary studies for a comparison between the conditions of the fur-seal rookeries and the seal life on the Pribilof Islands with those of the Commander Islands, I proceeded in the *Albatross* to the latter, under special instructions from Dr. Jordan, dated St. George Island, July 11, 1896. These instructions directed me to investigate the conditions on the Russian islands as compared with those of last year; to proceed thence to such of the Kuril Islands upon which seal rookeries are reported to occur, and to Robben Island in the Okhotsk Sea, with a view to obtain as complete information concerning them as time and circumstances would permit; and finally, to gather in Japan from the authorities and other persons interested such information as to the sealing industry of the Japanese islands and such statistics concerning the pelagic sealing in Asiatic waters as might be practicable.

Accordingly the Commander Islands were visited betwen July 30 and August 9. The middle Kurils, upon which seal rookeries were credibly reported to occur between August 22 and 25, and Robben Island on August 29 and 31. Iturup, the largest island of the Kurils was next visited, as it was supposed to be the headquarters of the sealing interest of the Japanese Imperial Maritime Products Company, September 4 to 6. Considerable information was collected in Hakodate, where the *Albatross* stayed from September 10 to 19 and in Yokohama and Tokyo from September 22 to October 22, the vessels having to go into dry dock at Yokoska.

ACKNOWLEDGMENTS.

Special and grateful acknowledgment is due to Lieut. Commander Jeff. F. Moser, commanding the U. S. S. *Albatross*, himself one of the Bering Sea Commissioners, for ever-ready cooperation, assistance, and courtesies during the work too numerous to mention, as well as for pleasant companionship during a long and often trying cruise. Similar thanks are due the other officers.

I wish to call attention to the valuable aid and information we received from the Japanese authorities and especially to mention Dr. Fujita, director of the bureau of agriculture in the imperial department of agriculture and commerce at Tokyo; Dr. K. Kichinouye, chief of the scientific inquries of the fisheries bureau, and Mr. K. Otaki, then in the same bureau; Profs. K. Mitsukuri and I. Ijima of the Imperial University, Tokyo; and Mr. Nozawa, the naturalist and fisheries expert of the Hokkaido-cho, besides a large number of scientific gentlemen connected with the departments and scientific institutions in Tokyo.

Thanks are also due to the then United States minister at Tokyo, Mr. Edwin Dun, and to Mr. McIvor, late United States consul-general at Yokohama, for courtesies and assistance rendered.

Very valuable aid and information has also been received from many private persons in Japan, among which it is a great pleasure to mention Capt. H. J. Snow, of Yokohama, for his invaluable addition to the authentic history of the Kuril Islands, and Mr. E. J. King, of Hakodate, for detailed information concerning the pelagic sealing and for many courtesies. Captains Hansen, Funcke, Petersen, and others have also contributed to our store of information, and thanks are extended to them, as well as to a number of other persons who have contributed in a minor way.

II.—THE JAPANESE FUR-SEAL ISLANDS.

By the cession of the middle and northern Kurils in 1875 by Russia to Japan, the latter country became the owner of a large number of barren and mostly uninhabited rocky islands and islets which nobody expected to possess any wealth except possibly a few sea-otters left over from the Russian management, and although even then a very costly fur, the sea-otter skin had not yet reached the fabulous prices[1] which have been paid for them of late years. Neither party to the treaty knew that several fur-seal rookeries of considerable value had changed hands by the transfer, and that the homes of the northern fur seal, which at one time belonged to Russia alone, from now on were subject to three different suzerainties.

As a matter of fact, as will be shown further on, the existence of these rookeries in Japanese territory hardly became known until they had been almost irreparably ruined by their discoverers. No sooner, however, had this knowledge become public before speculation was rife as to the occurrence of similar treasures in other islands belonging to the Empire. In this connection it was recalled that H. B. M. S. *Bittern*, on July 8, 1855, in latitude 40° 31′ north and longitude 139° 31′ east, had discovered a cluster of 3 small rocks, since named the Bittern Rocks,[2] "the face of which was covered with seals, which were with difficulty dislodged." It was conjectured that these seals were fur seals, but I was positively assured in Hakodate that sealing schooners had investigated the matter and that the seals were "hair seals" only.[3] It would thus appear that the fur-seal rookeries in Japan are confined to the Kuril Islands.

I. DESCRIPTION OF THE KURIL ISLANDS.

The Kuril Islands, or, as the Japanese call them, Chishima (*i. e.*, The Thousand Islands), form a graceful arch of volcanoes, many of them quite active yet, between the northeastern end of Yezo in the south and the south end of Kamchatka, Cape Lopatka, in the north, roughly speaking, between 43° 40′ north latitude, 145° 22′ east longitude, and 50° 50′ north latitude, 156° 30′ east longitude, a distance of about 630 miles (pl. 104).

The islands, which, in administrative respect, belong to the Hokkaidocho, *i. e.*, Yezo, with adjoining islands, are of various sizes, from Iturup, the largest, with an extreme length of 110 miles, to the islets of Srednoi and Mushir, a few hundred feet long, and rising out of the water, from the lofty and gracefully cone-shaped peaks of Alaid (7,783 feet) and Paramushir (6,900 feet) to the small rocks, barely awash, which are to be the main topic of this report.

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[1] Some are said to have sold lately for £240.

[2] "Two above water and one awash. * * * The southwestern or largest rock * * * is about 18 feet high, and in size and appearance resembles the hull of a vessel of about 200 tons." Findlay, Direct. N. Pac. Oc., 2 ed., p. 658.

[3] Capt. E. P. Miner states that in 1883 the schooner *Otsego* found seals on the Bittern Rocks, but whether fur seals or hair seals is not evident. (Fur Seal Arb., VIII, p. 580.)

Of apparently recent and exclusively volcanic origin, many of the islands are still active, and on a fine day in the middle group it is an inspiring sight to watch the steam and smoke issuing from the craters, while down near the sea hot springs send forth their sulphurous white vapor. Nor are violent eruptions of rare occurrence, and many a graphic tale is told of the imposing spectacle of these fiery chimneys.

The Kuril chain separates the Okhotsk Sea from the Pacific Ocean, the only direct communication between them being through the straits separating the islands. They may be conveniently divided into three groups—the Northern Kurils, the Middle Kurils, and the Southern Kurils.

The term Northern Kurils embraces the islands between Kamchatka and the Seventh Strait, or Forty-ninth Degree Passage, viz, Shumshu (Shimushu), Paramushir, Alaid (Araido), Shirinki, Makanrushi, Avos, Onekotan, and Kharimkotan (Harumukotan). Of these Paramushir is a large island, about 60 miles long, with peaks nearly 7,000 feet high, while Avos is described as a small, precipitous cliff between 150 and 200 feet high, too steep to afford a landing anywhere. Between Paramushir and Onekotan is the Amphitrite Strait, most commonly used for passage from the Pacific Ocean into Okhotsk Sea and vice versa.

The Middle Kurils (pl. 105), situated to the southwest of the northern group, extends south to the Boussole Strait, and comprises the islands of Chirinkotan, Yekarma (Ekaruma), Shiashkotan (Shasukotan), the Mushir Rocks, Raikoke, Matua (Matsuwa), Rashua (Rashuwa), the Srednoi Rocks (Sredneva), the North and South Ushishir Islands, Ketoi, and Simusir (Shimushiru). As this group is to be described more in detail later on, it will suffice to say here that Simusir and Shiashkotan, the southern and the northern islands, are the largest, being about 33 and 12½ miles long, respectively.

The Southern Kurils, south of the Boussole Strait, consist of Broughton Island (Buroton Jo), or Makanruru,[1] the Chirnois (Chirihoi), comprising two large islands, viz, Chirnoi and Chirnoi's Brother, with a couple of small rocks, Urup, Iturup (Yeturufu), Kunashiri, Skotan (also called Shikotan, or Shakotan), and finally a number of small islands between the latter and the Nemuro Peninsula of Yezo. From Iturup south the islands are wooded and inhabited and do not concern us much in the present connection.

The charts of the Kuril Islands, until a couple of years ago, were in a wretched condition. Nearly all the islands were out of position and their outlines bore no semblance to the real shape of the islands. Thanks to the good work of Captain Snow, who furnished the British admiralty with some excellent sketches of each island, which have been published by the latter (No. 2128),[2] this evil is now to a great extent removed, though some details are yet to be corrected. Thus Ketoi is evidently placed too far north and west in relation to Ushishir; the western shore of Rashua is laid down too far west; the Mushir rocks are slightly too far north. These and a few minor alterations have been introduced in the maps accompanying this report, chiefly from a number of traverse plane table sketches made at various points in the Middle Kurils (pls. 104–107).

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[1] Not to be confounded with Makanrushi, of the northern group.

[2] By a very unfortunate circumstance the Japanese copyist who transferred the British admiralty chart No. 2128 into the Japanese hydrographic office chart No. 343 got mixed up on the names Makanruru and Makanrushi. As a consequence the latter is called Broughton Island (or Boruton in the Japanese version) while in reality this name belongs to the former. Conversely on the Japanese copy of the British admiralty chart No. 2405, viz, their hydrographic office chart No. 141, the altitudes of these two islands have become wrongly transposed, in as much as Makanruru is said to be 3,900 feet and Makanrushi 1,782, while the facts are the reverse. The sooner these errors are corrected the better.

METEOROLOGY.

There has never been published, nor has there to my knowledge ever been taken, any series of reliable meteorological observations on the Kuril Islands. All that we know of the climatic conditions is therefore gathered from comparisons between the observations taken in Yezo, Sakhalin, and Kamchatka, as well as from the general statements of those who have lived some time on the islands.

Our own sojourn among the Kurils was too short to throw much light on the question. During our stay in the middle Kurils we were favored with pleasant weather, though occasionally bothered by the fog for which these islands are justly celebrated. Fragmentary as the information is, it may be well to incorporate it in these pages.

Prof. C. Carpmael, F. R. S. C., director of the meteorological service of Canada, has given a few general statements as to the mean temperature of the Kuril Islands, apparently chiefly based upon the curves in the *Challenger* report. In May * * * the mean temperatures in the Kuril Islands are probably between 40 and 44 degrees. * * * The *Challenger* report makes the Kuril Islands [in June] somewhat over 55 degrees, but the temperature at Nemuro, taken with those on Saghalin Island and at Petropavlovsk, would lead me to the conclusion that 50 degrees must be very near the mean on all of them. * * * In July * * * the mean * * * in the Kuril Islands is probably a little under 60 degrees. * * * In August the mean * * * over the greater portion of the Kuril Islands * * * a little under 60 degrees. * * * In September the mean lies between the extremes at [Bering Island 46.8, and Robben Island a little below 55 degrees]. (Fur Seal Arb. Proc. VIII, pp. 511–512.) The mean temperatures in the fur-seal islands of the Kurils are probably lower than the above figures.

Captain Snow, in his recently published Notes on the Kuril Islands, gives a summary of the climatic conditions of the Kurils based upon an experience of fifteen years, as follows:

> The climate of the Kuril Islands is decidedly a moist one, although it can not be said that the rainfall is large.
>
> The spring is cold and boisterous; during the early part northwesterly winds prevail, and there is but little fog. Throughout the latter half the winds are very variable, with occasional spells of snow, rain, and fog.
>
> Large ice fields are brought across the Okhotsk Sea in February, and these become blocked on the Southwest Kurils and east coast of Yezo, and it is sometimes well into May before all the ice has cleared off from this vicinity.
>
> Fog almost constantly prevails throughout the summer, and, generally speaking, it is only with a fresh northwest wind that it clears off entirely at this season. The clear spells, however, are of short duration.
>
> The autumn is the finest season—bright, clear, pleasant weather, with westerly winds, this sometimes continuing even until the middle of November.
>
> The winter is cold, and northwest winds blow throughout the greater part of it. During the winter the writer spent on the Island of Yetorup there were many fine days when the weather was

quite warm, the sun in that latitude—45° north—having, of course, considerable power. The nights, however, were very cold, although it was seldom the thermometer fell to zero Fahrenheit.

The following is a rough summary and average of the weather for each month of the year, gathered from log-books and notes extending over a period of fifteen years.

SPRING MONTHS.—*March.*—Sixteen days of west and northwest winds, seven southeast, five east, and three variable. Snow or rain falls on ten days, and two days are foggy.

April.—Westerly and northwesterly winds prevail during the first half. During the last half the winds are very variable, with frequent gales. Snow or rain falls on twelve days of this month.

May.—May has an average of fourteen foggy days, with eight days on which snow or rain falls. The winds are very variable, but southerly and easterly predominate. Gales are frequent.

SUMMER MONTHS.—*June.*—Winds very variable, mostly from southeast to southwest. Rain falls on six days, and there are sixteen foggy days. Fog and rain often occur together. Sometimes it is difficult to distinguish between a wet fog and a fine drizzling rain. I have experienced a sharp frost on the 6th of June at Rashau Island, in latitude 47° 44′, and a fall of snow sometimes occurs in this month.

July.—This is the foggiest month of the year, with an average of twenty-six days thick weather and six days rain. Light, variable airs and calms during the greater part of this month.

August.—It is foggy on twenty days and rainy on six days of this month. Calms and light variable winds prevail.

AUTUMN MONTHS.—*September.*—Rain falls on ten days of this month, and there is more or less fog on twelve days; but taken on the whole the weather is mostly fine and pleasant, westerly winds prevailing.

October.—The winds this month are chiefly from the west-southwest, west, and northwest. There are six rainy days, and little or no fog. It is seldom calm. As a rule the weather is bright, clear, and bracing, with fresh breezes and occasional strong gales.

November.—The prevailing winds are westerly and northwesterly. The weather is mostly fine, with fresh breezes during the first part; later it becomes more boisterous, and considerable snow falls.

WINTER MONTHS.—*December.*—This month shows twenty days of northwesterly winds, three southerly, and the rest calms and variable. Snow falls on twelve days and rain on two.

January.—Fifteen days of northwesterly winds, three north, four northeast, and nine variable or calm. Snow on six days and rain one.

February.—There are twenty-two days of northwesterly winds, two northeast, two north, and two southeast during this month. Snow falls on sixteen days.

GALES.—Heavy gales are liable to occur at any time of the year, and I doubt if ever any one particular month passes without one or more violent storms of wind. The majority of the gales experienced in these latitudes finished up at northwest. Of fifty-eight heavy gales occurring between the middle of April and the middle of October over several years, I find thirty-five finished at northwest, eight at southwest, three at west-southwest, three at east, and the rest at other points of the compass. The greatest number took place in May, and the least in June. In nearly all the storms which finished at northwest the wind veered *against the sun* from the southeast. When a gale commenced at southeast, or from any point east of it, it would, as a rule, haul to the east, then northeast to north and northwest, where it would blow itself out. With gales commencing at south, the wind, after backing perhaps to nearly east, would generally veer *with the sun* through south and southwest, and finish between southwest and west-northwest.

Some of the storms which occur during the summer and autumn in the vicinity of the southwestern Kurils have the characteristics of typhoons, in fact are typhoons which have traveled up the Japan coast, their area being, no doubt, much enlarged and their force somewhat spent.

During a heavy gale the wind blows strongest off the land. The islands being high and *narrow*, the wind becomes banked up, as it were, and pours over the mountains and down the gullies with hurricane force, picking up the water in sheets and whirling it into *woolies*, which are blown out to sea with terrific velocity.

Great care is necessary when running in under the high land of these islands during a gale. With a sailing vessel, in a moderate breeze, it is advisable to pass to windward of an island in order to keep the wind; but unfortunately the windward side is always the foggy side. The high mountains cause the winds to be very baffling in the various straits, particularly the smaller ones.

The barometer is of great service in these latitudes, and never fails to give warning of an approaching storm. During summer an abnormally high barometer for a few days will nearly always be followed by a steady fall, culminating in a gale with heavy rain from southeastward.

FOGS.—The constant fogs in the vicinity of the Kuril Islands and east coast of Yezo during the summer are no doubt caused by the southerly winds passing first over the warm waters of the *Kuro Shiwo* (black stream) and its branch, the Kamchatka currents, the mean summer temperature of which is 82°, and then on to the cold water of the Oya Shiwo, the temperature of which, along the Kurils, is usually from 35° to 36°.

These fogs vary in their nature. Sometimes they are dry, in which case they usually extend to a considerable height, and in calm weather will "lift" some 80 or 100 feet or more above the surface of the sea, leaving it perfectly clear below. At other times the fogs are dense and full of moisture, amounting almost to a drizzling rain. These often reach to a considerable height, and are generally accompanied by a cloudy sky. * * *

ICE.—About the 10th of February ice fields begin to make their appearance off the northwest coasts of the southern Kurils.

This ice is formed in the northern and northwestern parts of the Sea of Okhotsk, and as it gets broken up is carried by currents and winds across that sea to the islands, where it often blocks the coasts and straits for hundreds of miles. The wind has much more to do with the direction these ice fields take than the currents, a moderate breeze being sufficient to drive the floes, even against the Oya Shiwo.

The surface of these fields of ice is very uneven and hummocky, thus giving the wind considerable hold, the piled-up masses acting as sails. The thickness of this ice usually varies from about 12 to 30 feet, the snow upon it is adding considerable to its bulk.

These ice fields eventually all find their way through the straits into the Pacific, where, after being driven beyond the cold waters of the Oya Shiwo, they are quickly melted. The ice often fills the space between Yetorup, Kunashir, the eastern coast of Yezo and Shikotan, and sometimes it finds its way down the southeast coast of Yezo, almost as far as Cape Yerimo. During the early part of April, this year (1892), the ice was driven into Kushiro on this coast, wrecking two small steamers which were lying there. In April, 1887, the American whaler *Europa* was forced on to the shore of Kunashir by the ice and was lost. By the middle of May, as a rule, the ice has all disappeared.

PLANTS OF THE KURIL ISLANDS.

I am not aware that any botanist has published a special treatise upon the plants of the Kuril Islands except Prof. K. Miyabe, whose "Flora of the Kuril Islands" was issued in 1890 by the Boston Society of Natural History (Mem. Boston Soc. Nat. Hist., IV, No. VII, pp. 203–275 + pl. XXII). Nor do I know of any more recent additions to that flora. His list may therefore be taken both as a starting point and as a fair exposé of the present knowledge of the plants of the region.

Miyabe himself visited and collected in Ikotan, Iturup, and Urup, while the records of the species in the northern islands are derived from the collections and publications mostly of Russian botanists. In the entire list there is no reference to a single plant from the Middle Kurils, except in one instance from Matua and two from Ketoi. Under these circumstances it is to be particularly regretted that my opportunity for collecting plants was so limited, and that the season was so far advanced as to render the collection of serviceable specimens very difficult.

The rocks of Mushir visited by me had only a few species of plants on them; these, or most of them, I collected. On Raikoke I was not within reach of the plants. Srednoi Seal Rock was entirely devoid of higher vegetation. Only the Ushishirs offered a richer field for the botanist, though even in this case limited [illegible] egetation was here exceedingly luxurious, but the number of species near the beaches, the only portion visited by me, was small.

Dr. J. N. Rose, of the National Herbarium, has kindly named the few plants I was able to gather tentatively, with the exception of the grasses, which were named by Professor Scribner. The following is the list. The number preceding the species is that of the plant in Professor Miyabe's paper, while that following the name of the locality is the collector's number. The sequence is that of Miyabe's paper:

(12) *Aconitum fischeri* Reich.?
  Ushishir (No. 70).
  Cochlearia officinalis L.
  Mushir, Long Rock (No. 64).
(103) *Sedum roseæ* (L.) Scop. = *S. rhodiola* D C.
  Ushishir (No. 69).
  Selinum? sp.
  Mushir (Long Rock). Dr. Rose considers this plant a possibly new species of *Selinum*, but regards the material as insufficient for description (No. 63).
(136) *Anaphalis margaritacea occidentalis* Greene = *Antennaria margaritacea* R. Br.
  Ushishir (No. 68).
(148) *Artemisia vulgaris* L.
  Ushishir (No. 74).
(155) *Senecio dahuricus* Schulz Bip.
  Ushishir (No. 67).
  Oxyria reniformis Hook.
  Ushishir (No. 71).
(257) *Maianthemum bifolium* Gaertn.
  Ushishir (No. 72).
(288) *Deschampsia flexuosa* Trin.
  Ushishir (No. 66).
  Poa turneri Scribner.[1]
  Mushir, Long Rock (No. 65). This is an undescribed species which Professor Scribner considers identical with a *Poa* collected by L. M. Turner on Atkha Island, Aleutian Archipelago. The specimens collected by Turner appear to be all females and those from Mushir all males.

In addition to these plants I observed:

(141) *Chrysanthemum articum* L. and
(151) *Senecio pseudo-arnica* Less. on Raikoke;
(298) *Elymus mollis* Trin. on Mushir (Long and High Rocks) and Ushishir.

On Ushishir, in addition, I saw an intensely golden and large *Taraxacum*; an *Angelica*, very much like *A. archangelica;* (117) *Heracleum lanatum* Michx., and *Cochlearia officinalis* L.

Insignificant as the collection is, it will be seen that it adds 4 species to the Kuril flora, viz, *Oxyria reniformis*, *Cochlearia officinalis*, *Selinum* sp., and *Poa turneri*.

Professor Miyabe having enumerated 317 species, the total number is now raised to 321, distributed as follows:

	Orders.	Genera.	Species.
Polypetalæ	21	71	123
Gamopetalæ	14	58	100
Monochlamydeæ	6	13	20
Dicotyledons	41	142	243
Monocotyledons	7	33	54
Angiospermæ	48	175	297
Gymnospermæ	1	5	6
Phanerogamæ	49	180	303
Crypotogamæ (vascul.)	4	10	18
Total	53	190	321

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[1] Since this MS. was prepared the description of *P. turneri* has been published with an illustration in Bull. No. 8, p. 5, t. 1., 1897. According to Professor Scribner the species is closely related to *P. hispidus* Vasey. Doctor Stejneger's plant is cited as the type.

J. N. R.

From his interesting chapter "On the Kuril Flora and its Relations to the Flora of the Neighboring Countries" (*op. cit.*, pp. 207–212), I have culled the following general remarks: After having demonstrated the northern nature of the flora, he shows that it is relatively rich in Rosaceæ, Ericaceæ, Caryophyllaceæ, Scrophulariaceæ, Caprifoliaceæ, and Borraginaceæ, while comparatively poor in Cyperaceæ (?), Labiatæ, and Polygonaceæ. "Every order which is represented in the Kuril Islands is also represented in a greater or less degree throughout the Northern Hemisphere, many passing into the Southern. As to the genera, 156, or about 84 per cent of the total number, are amphigæan—that is, they are found throughout Europe, northern Asia, and North America. Of the remaining 31 genera only 3, *Skinnnia*, *Crawfurdia*, and *Acanthopanax*, are restricted to eastern and tropical Asia. Twelve genera may be called Europo-Asiatic. * * * The remaining 16 genera are more or less confined to Asia and North America. We have only 4 genera in the Kuril Islands which are peculiar to eastern North America and to eastern Asia. * * * As to the species, 97, or about 30 per cent of the Kuril vegetation, are distributed throughout Europe, northern Asia, and North America. For the northerly situation of the islands, the proportion of the circumpolar species is comparatively small. * * * There are only two endemic species, and these of a rather doubtful character, * * * [but] *Prunus Ceraseidos*, Max., var. *Kurilensis*, may prove to be a good species. * * * Seventeen species and two varieties are restricted to the insular limits of Japan and Saghalin; of these, two species and one variety are peculiar to Hokkaido." A table prepared by Professor Miyabe (exclusive of the circumpolar forms) "shows at once the great preponderance of the Asiatic species, the greater portion of which are restricted to the eastern and northeastern parts of Asia. Next in importance come the Americo-Asiatic, which divide themselves into two distinct groups, the American and North Pacific. The latter constitutes by far the more prominent part. * * * The Europo-Asiatic elements are also liberally represented. If the species which extend into northwestern America are included, they form about 24 per cent of the whole. * * * In the Kurils we have no species which are limited to the Atlantic States in North America."

As might be expected, "the vegetation of the southern Kurils is very much like that of Japan (northern), while that of the northern approaches remarkably that of the Bering Sea region (northeastern Asiatic and northern Pacific)." From the character of the few plants which grow in Kamchatka and in Japan, without being of wide distribution in the northern hemisphere, but which have not yet been found in Sakhalin, Professor Miyabe concludes that they do not necessarily prove any immigration into Japan from the north via the Kuril chain, especially in view of the recent formation of the northern Kurils as shown by Professor Milne. "The scanty vegetation which we find in these northern islands is mostly composed of plants growing in Kamchatka and the Aleutian Islands. The greater part of them are not yet known to come down to the southern Kurils. A few plants, which are decidedly characteristic of northern Japan and the southern Kurils, have also been found in some of the smaller islands north of Urup. *Petasites japonica*, for instance, is said to extend as far north as the island of Matua, and *Bambusa kurilensis* and *Taxus cuspidata* to Ketoy. Thus it seems that the Kurils are now in the stage of receiving their vegetation from both Kamchatka and the southern Kurils. * * * From these observations I agree with Professor Milne in the opinion that at the time of the last great southerly migration of the rich polar flora Japan received her portion mostly through the island of Saghalin, and but little, if any, through the then uncompleted chain of the Kuril Islands."

2. THE ROOKERY ISLANDS.

(Plate 105.)

Rumors and yarns of returning sealers, some of whom had never set foot on the Kuril Islands, having been given credence, there is hardly an island in the Kuril chain that has not been set down as possessing a fur-seal rookery. A few seals may have been found hauled out on some of the other islands, as for instance the three or four seals which Captain Petersen, of the *Diana*, found on the southern Chirnoi Island, near its northern point,[1] about the year 1888, or may have been killed in the water near some rock or island, as the 60 alleged to have been taken by the *Diana* at Avos (Jap. Fish. Bur. Rep., 1894, p. 202), but it is now certain there that is no authentic record of breeding seals on more than four islands, the number on one of which, however, being so small as to be hardly worthy of the name rookery. The latter island is Makanruru or Broughton Island, in the southern group; the other three are Sea Lion Rock or Flat Rock, one of the Srednoi Rocks, Raikoke Island, and Seal Rock of the Mushirs, all situated in the Middle Kurils.[2]

MUSHIR ROCKS. (Plate 106.)

The Mushirs, described by Pallas in 1783 as Mussyr, or Egakto (Neue Nord. Beitr., IV, p. 123), a cluster of four small rocks, were rediscovered in 1805 by Von Krusenstern, in the Russian frigate *Nadezhda*, and were named "The Snares" by him on account of the dangerous currents with which they are beset.

They are situated approximately in 48° 37′ north latitude, and 153° 47′ east longitude, about 13 miles distant from Shiashkotan, the nearest island to the northward, and 32 miles from Raikoke, which is in a southwesterly direction. The greatest distance between any two of the rocks is a little over a mile,[3] while the two nearest to each other are less than a third of a mile apart.

The four separate rocks of which the group consists have been named Seal Rock, Long Rock, High Rock, and Low Rock.

Low Rock, as the names implies, is a small rock about 20 feet out of the water. It is bare of all vegetation save seaweeds, and when I visited the group a few sea lions had taken possession of it.

High Rock (pl. 80) is a large mass of basaltic columns rising nearly perpendicularly out of the sea to a height of about 120 feet. It is split completely in two at the middle, and in the cleft between the precipitous cliffs a chimney-like pinnacle stands erect, almost as tall as the rest of the rock. The top is covered with a luxuriant growth of grass (*Elymus*), and numerous sea birds nest on its sides.

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[1] For the sake of completeness I have added the plan of the Chirnoi Islands, by Snow, and an outline sketch of them by Mr. Kitahara (pl. 13), taken from his report of a cruise in the Kurils in 1895. (Rep. Jap. Fish. Bur., 1895). A single seal was taken by the *Junten Maru* off Chirnoi, on August 23, 1896, according to the official report to the Japanese fisheries bureau.

[2] S. L. Beckwith's statement that he "remembers that there was a seal rookery on Ketoi Island" (pl. 86) "about 1873 or 1874" is unsupported by other evidence. (Fur Seal Arb. VIII, p. 581.)

[3] In the Japanese copy of Captain Snow's Kuril Island plans (Jap. Hydr. Off., No. 343), the scale of the plan of the Mushir Rocks is erroneously given in miles instead of cables.

Long Rock (pls. 81, 82) is long and narrow, being nearly 1,200 feet long (the surrounding reef included) by about 400 wide. It is not nearly as high as High Rock, being only 87 feet, as measured by my aneroid. This rock is also basaltic, with a distinct columnar structure, but, unlike High Rock, it is surrounded by a rocky beach which on the south side is fully 100 feet wide on an average, but considerably narrower on the north side. The high portion has more or less sloping sides, covered and capped with a very thick sod of long and stiff grass (*Elymus*) which the sea parrots (*Lunda cirrhata*) have honeycombed with their nest burrows. A cleft splits the high portion in two halves clear to the base. Numerous sea lions occupied the beach at our arrival, but no trace of seals or seal rookery could be found on this rock, although the beach looked rather favorable, and the series of rocks between this islet and High Rock would seem to be a fine place for fur-seal pups to sport and learn to swim in. In addition to the numerous sea birds, a couple of ravens were observed, as well as a number of grasshopper warblers (*Locustella ochotensis*) among the high grass, and a few specimens of the Kamchatka wagtail (*Motacilla lugens*). The number of species of phænogamous plants is exceedingly small, as I could only discover three, viz, *Cochlearia officinalis*, *Poa turneri*, and *Elymus mollis*.

Seal Rock is the southernmost of the three, and distant about a mile from Long Rock and High Rock. It is not quite as large as either, nor as high, being probably less than 700 feet in length, while the height is certainly not more than 80 feet. Like the others it consists exclusively of basalt, but unlike them it is entirely devoid of soil or vegetation, and it rises abruptly out of deep water without any outlying reef or rocks. The rise is precipitous on all sides except on the northern side, and even here landing can only be effected with difficulty on account of the heavy swell which usually beats against this rock. Thus, although the sea was not particularly rough on the day I visited the Mushirs, it was found impossible to land on this rock. The top gradually rises into two rounded hills.

As the name indicates, Seal Rock is the one upon which the breeding seals used to haul out, and according to the unanimous testimony of the men who took seals there in former days, this was the only one upon which there was any rookery. It being impossible to land, I had the boat pulled around it, and although every foot of the ground could be seen, and was scanned carefully through the binocle, not a seal was to be discovered. Sea lions there were hundreds of, but no fur seals; nor were any seen in the water, though the few who still haul out here—and we have record of at least one having been seen there this year (1896)—may just have happened to be away feeding. But it was only on August 22, and as no pups were to be seen, it is safe to say that there was no rookery.

Plate 106 is a traverse plane table sketch map of the Mushirs, made by me on August 22, 1896. For this purpose I landed on Long Rock and on High Rock, the station occupied on the former being the eastern high point, that on High Rock being the northwest point, the only place where I could effect a landing. It will be seen that it agrees pretty well with Captain Snow's sketch, from which I have also taken the position of the sunken rocks, the soundings, and the scale.

RAIKOKE (Plate 105.)

Raikoke is situated about 32 miles S. 57° W. from the Mushir rocks, in approximately 48° 20′ north latitude and 153° 05′ east longitude. The much larger island, Matua, is located nearly due south from it, 9 miles distant.

It consists of a single volcanic cone (pl. 83) rising out of the oceanic depths, its sides sloping at angles of about 30° to 33° toward the top, the rim of a crater evidently long since fallen in. It is now apparently quite dead, but according to the old records was in eruption as late as 1778 and 1780. It is said to be 2,050 feet high and is nearly circular, as shown in Snow's map, with a diameter of about 1¼ miles. The sides are even slopes of volcanic ashes, with here and there a few more solid rocks protruding. The base against which the waves of the Pacific Ocean and the Okhotsk Sea beat is composed chiefly of steep basaltic rocks 40 to 80 feet high, but seldom cooled off into columnar structure, being mostly massive and presenting large, smooth surfaces. The lower portion of the slopes above this blackish foundation is covered with a vivid green of the same three plants which I collected on Mushir rocks, with the addition of a large, fleshy-leaved, yellow-flowered composite (*Senecio pseudoarnica*) and a white daisy (*Chrysanthemum arcticum*), while the rocks were covered in places with a very bright-yellow lichen.

At all the prominent points and corners the rocks rise precipitously out of apparently very deep water, but in between there are occasional narrow beaches covered with bowlders from the size of a cart wheel to that of a small house, while in other places the equally narrow beach is fringed by a steep bevel of rounded, waveworn stones from the size of a fist to that of a man's head. A couple of such beaches, with a quantity of driftwood left at the upper line of the bevel next to the main ashy slope of the island, were found on the southern shore facing Matua.

On the east side only there are a few places where the bold, smooth face of the foundation cliffs are rent with deep clefts and caves, small coves with somewhat of a reefy beach, and a few detached larger rocks in front, giving a slight shelter. A couple of such rocks are also found on the western side of the island, but no coves or reefs.

I never saw a more unlikely place for fur seal to haul out upon. There is no spot among all the rookery grounds of the Pribilofs or the Commander Islands that for roughness and apparent lack of suitability can compare even remotely with Raikoke; and yet two distinct rookeries, according to Snow and Petersen, existed on this island, the larger one, on the western side near the northwestern corner, the other in the coves among the rocks mentioned above as situated on the east side of the island.

When I circumnavigated the island on August 23, 1896, not a fur seal could be discovered in either place, which is hardly to be wondered at, since, as we learned later, a dozen seals had been killed there only four days previously by the crew of the Japanese schooner *Yakuno Maru*.

On the other hand, sea lions (*Eumetopias stelleri*) were plentiful. At all suitable places all around the island harems, consisting of bulls, cows, and pups, were located, sometimes as high as 40 feet on the basaltic shelves almost perpendicularly out of the water. How they managed to climb up the slippery and precipitous rocks seemed a mystery. How they get down was less so, for as soon as they got the wind of us, they threw themselves headlong on the rocks or in the sea, sometimes gliding down *en masse* and piling up like water in a cataract. In the sea their behavior was quite different from that of the fur seal, for the family kept together as they swam, the old bull in the middle, very closely surrounded by his females and pups, with the pointed snouts sticking out of the water quite close together.

Water birds, especially fulmars (*Fulmarus glupischa*, the dark phase) were very numerous, but I observed also about half a dozen ravens near the old rookery on the west side.

My stay at the island having offered no opportunity for an independent map of the place, I have introduced a copy of Capt. H. J. Snow's sketch in the corner of the general chart of the fur-seal islands of the Middle Kurils (pl. 105).

SREDNOI ROCKS. (Plate 107.)

The Srednoi Rocks, famous as the first place in which breeding fur seals were discovered in the Kurils, are found 45 miles SSE. of Raikoke, the larger islands Matua and Rashua intervening. Situated scarcely 2 miles from the Ushishir Islands and separated from them it is stated by only 11 fathoms of water, they are properly only outlying detached rocks belonging to these islands, but as "seal islands" they have a distinct individuality, since fur seals are not known to have hauled out on the Ushishirs proper.

The latitude and longitude of the latter, or, more properly speaking, of the old village site on South Ushishir, is given on the British Admiralty chart (No. 2128) as 47° 32′ north latitude and 152° 42′ east longitude, but I may add that Lieut. Le Roy M. Garrett, U. S. N., the executive officer of the *Albatross* on our recent cruise in the Kurils, on August 25, 1896, determined the position as 47° 30′ 56.8″ north latitude and 152° 47′ 45″ east longitude.

The distance of the Srednoi Rocks from Rashua is between 6 and 7 miles, while the Ushishirs are separated from Ketoi, the next island to the southwest, by a channel about 15 miles wide.

The Ushishirs consist of two islands connected by a shallow bar, each a little more than 1½ miles in longest diameter. The northern island forms a rather low and flat plateau, with a cone-shaped knob, estimated at about 400 feet high, at its southwestern extremity. The South Island is entirely different, being in fact the narrow rim of an ancient crater the bottom of which is now covered by the sea to a depth of 26 fathoms. A narrow and shallow S-shaped channel on the south side leads into the circular and highly picturesque bay from which the walls rise up with very steep slopes to an average height of about 600 feet, while at the western corner the massive Dome Peak reaches an elevation of over 1,300 feet. On both islands there are traces of old habitations; in fact, some of the huts on South Island, said to be regular Aleut barabras, are still in a condition which shows that they have been inhabited at no very distant period.

The Srednoi Rocks proper consist of two larger rocks, viz, Black Rock and Sea-lion Rock; a small one, Button Rock, situated about 1½ miles to the southwest, a seaweed-covered rounded rock almost awash; and a cluster of similar, but still smaller rocks or stones, situated a similar distance to the southeast from Sea-lion Rock, and connected with the latter by a reef on which it breaks in several places. These are the so-called Sea Otter Rocks.

Between the two large rocks and Button Rocks the water is said to be 16 fathoms deep. They are separated by a channel less than half a mile wide with only 5 fathoms of water, and are surrounded by enormously thick beds of long kelp, through which we had the greatest difficulty in pulling our boat and effect a landing. Black Rock (pl. 84), the northernmost of them, is low, with a number of grotesquely formed isolated basaltic pinnacles, cliffs, bowlders, etc., some as high as 50 feet possibly, raised above the surface like stumps of teeth in a broken saw. It really consists of three or four disconnected islets, the sea communicating across it by narrow channels in several places. Plenty of sea lions were seen by us on this rock, but no seals, which, however, we are positively informed, never hauled out here.

The fur-seal rookery was located on the so-called Sea-lion Rock, or Flat Rock, as it is also named. This is a low, flat mass of basalt, scarcely more than 20 feet out of the water and about 700 feet wide by 2,000 feet long, trending northwest and southeast. At the time of our landing there, on August 24, 1896, it was perfectly white from the excreta of the large number of sea lions which had hauled out there, mostly large bachelors, as only a few harems were seen. On the south side (pl. 85), near the eastern extremity, there is a narrow bay or cove, just large enough for a boat, where a landing is easy. The stench which met us from the fecal matter and from a number (59) of putrefying carcasses of young sea lions which had been clubbed to death and skinned a short time before by some schooner's crew, was almost overpowering. Some large pools, filled with a mixture of water, blood, and urine were, particularly offensive, though the sea lions did not seem to take any notice of the stench. In other respects the rock presented an ideal hauling ground, and I have no doubt that the thick kelp beds outside protected the young seal pups almost as well as a reef. However, we saw no seals, and beyond the sea lions, only a limited number of water birds, including some sandpipers and turnstones. Of higher plants there was, of course, not a trace.

It was easy to see how the sealers during the occupancy of this rock by the fur seals could manage to kill so many animals in so short a time and exhaust the rookery so rapidly, for although low and comparatively flat the surface was sufficiently broken to afford ample shelter for a gang of men to conceal themselves, or even camp, without disturbing the breeding seals. Even with the shy and wary sea lions there was no difficulty in sneaking close up, as some of our photographs show (pl. 84).

The accompanying map (pl. 107) is constructed from several traverse plane-table sketches on the Srednois and in Crater Bay, South Ushishir, by the author, a series of sextant angles by Lieut. H. E. Parmenter, U. S. N., of the *Albatross*, taken on August 25, from the 760-foot top above the village on South Ushishir, and from Captain Snow's sketch as published by the British Admiralty. The location of the sunken rocks and the soundings are chiefly from the latter. The altitudes, when differing from Captain Snow's, are determined by Lieutenant Parmenter.

MAKANRURU ISLAND. (Plate 108.)

This island is also known as Broughton Island in preference to Makanruru, since the latter may easily be confounded with Makanrushi, an entirely different island, belonging to the northern Kurils.[1] Unlike the islands treated of above, it does not belong to the Middle Kurils, forming part, as it does, of the southern group. According to the British Admiralty chart, it is situated approximately in 46° 43′

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[1] This confusion has actually been made by the Japanese copyists of Captain Snow's plans of the Kurils, with the unfortunate result that the name Broughton (or Boruton) has been misapplied to Makanrushi.

north latitude and 150° 36′ east longitude, about 11½ miles from Chirnoi Island, 30 miles from Urup, and 35 miles from Simusir.

In size, general outline, and height it bears a close resemblance to Raikoke, as an inspection of the accompanying plan and illustration (pl. 108) will show, but beyond this the writer is unable to give more detailed information, as he did not have a chance to visit this island. From Mr. Kitahara's report (Rep. Jap. Fish. Bur., 1895, p. 145) it appears, however, that the few breeding seals which have been found there were located on the northern shore at a place which he describes as the largest area on the Kuril seal rocks fit for the purpose, the area being "about 60 meters square." Early in August, 1895, the *Third Chishima Maru* found there 2 males, 3 females, and 3 pups, and it was probably in this same place that Snow got his skins in 1893.

I am not aware that there are any records or indications of former human habitation on Makanruru.

Captain Snow (Notes Kuril Islands, 1897, p. 64) describes the island as rugged and dome-shaped, 2,900 feet high. Inaccessible cliffs, some of which are over 1,000 feet high, extend all around the island. Here and there beneath the cliffs are narrow margins of bowldery or pebbly beach. On the northwest side there are some rocky heights and also some rugged patches of rocks, the largest of which is used as a breeding rookery by vast numbers of sea lions.

The accompanying plan of Makanruru Island (pl. 108) is a copy of Captain Snow's sketch and the outline view is from Mr. Kitahara's report cited above.

3. HISTORY OF THE JAPANESE FUR-SEAL ISLANDS.

EARLY CONDITIONS.

The occurrence of fur seals on the Kuril Islands was known to the early Russian explorers, but I am not aware that any of the records contain references to breeding rookeries on these islands. It is not probable that even the old Russian-American Company, which in 1826 located a colony of Kadiak Aleuts on the Kurils to hunt the fur-bearing animals (see my Russian Fur-Seal Islands, p. 26, *antea*, p. 36) knew of the existence of any rookeries, much less exploited them. Certain it is that the Japanese Government when, in 1875, it took over the Kuril Islands from Russia in exchange for southern Sakhalin had no idea that fur-seal rookeries were a part of their new possessions. It is clear beyond a doubt that the entire report which the Japanese Government submitted to the British Bering Sea commissioners in 1891 (published as "Memorandum on the Seal Fisheries in Japan," Rep. Brit. Behr. Sea Comm., pp. 160–164; Fur Seal Arb., VI, pp. 228–233), upon which the latter framed an elaborate account of the early sealing industry in Japan (Rep., pp. 85–87; F. S. Arb., VI, pp. 131, 132), relates almost exclusively, except the last paragraph, to the sea otter, and not to the fur seal at all.

Under these circumstances it is hardly to be wondered at that when the news of the raids on the Kuril rookeries in the early eighties gradually leaked out there were people willing to theorize and to believe that these rookeries were new formations, being established, it was surmised, by Commander Islands seals which had been disturbed by the wholesale killing on the latter islands, and consequently had retired to the quiet resorts of the foggy Kurils. These theorists never stopped to reflect that the Commander Islands rookeries were actually increasing at the very time the supposed emigration would have taken place and that the killing of the greatest number of seals on Copper and Bering islands occurred long after the Kuril Island rookeries had been thoroughly destroyed.

But it is not necessary to have recourse to such revolutionary theories in order to explain the late discovery of the Kuril rookeries.

In the first place, the islands upon which the seals were finally discovered to breed are very small, hard to find, dangerous to approach, and difficult to land upon, and in the second place, the seals themselves may be easily mistaken for sea lions by people not familiar with both animals. As very instructive examples of how easy it was to miss these rookeries I may quote two instances. In 1881 Captain Sandman, agent of Hutchinson, Kohl, Philippeus & Co., the lessees of the Commander Islands rookeries, and captain of their steamer *Aleksander II*, a man of many years' intimate knowledge of the seals and the seal business, with his vessel visited the Middle Kurils, especially Srednoi Rocks, for the particular purpose of finding these rookeries, the existence of which he had learned from the Aleut colonists who had returned from the Kuril Islands upon their cession to Japan. He had even one of the very men on board who, himself, in 1877, had seen the rookery on Srednoi.[1] Yet he failed to find the seals which during that same year were discovered on Srednoi Flat Rock by Captain Snow.[2] But even the latter, intrepid and fortunate discoverer of seal rookeries as he is, missed a similar opportunity once himself, as he related to me in 1896. In 1883 he landed on Raikoke and was scarcely more than a hundred yards from the seal rookery without recognizing it as such. He mistook the seals for young sea lions, went on board the *Otome* again, and sailed for the Commander Islands.

But even these incidents fail to alone explain the fact that about 25,000 breeding seals could remain unknown so long, and the only reasonable supposition is that the rookeries had possibly been overlooked because of the insignificant number of seals composing them, these being then probably confounded with the sea lions, while it was due to a very decided and considerable increase in their ranks that the discovery was finally made.

In explanation of this let us bear in mind four facts, viz: (1) That while the Kuril Islands north of Iturup are entirely uninhabited by natives at present, yet there was a time when not only all the larger islands had villages of human habitations, but even the smaller ones, such as the Ushishirs, Rashua, and Matua, the latter all located in the immediate neighborhood of the seal rocks; (2) that the fur-seal rocks themselves have never been inhabited by man; (3) the gradual decrease of the Kuril population during the Russian régime and its almost total extinction upon the cession of the islands to Japan in 1875; and, finally, (4) the wonderfully recuperative powers of the rookeries when left undisturbed both at sea and ashore, as exemplified by the remarkable history of Robben Island, which, in 1870, upon its rediscovery, yielded in one year probably more than 15,000 skins after having been "practically cleaned out" scarcely more than fifteen years previously.[1] By remembering these facts it is not difficult to understand that during the time of a more numerous population of the islands the seals were kept down to such a minimum as not to be of sufficient value to attract the attention of the Russians, who were much more anxious to obtain sea otters and foxes,[2] but that upon the gradual decrease of men in the neighborhood of their haunts the seals themselves were annually increasing until the rediscovery of the rookeries by white men in 1881. That the few remaining natives knew of the existence of the seals on the island is proven by the fact that Captain Petersen, when he visited the native village on Rashua in 1876 and found fur-seal trimmings on the clothes of the inhabitants, was informed by them that the seals occurred in numbers on Srednoi, the unwillingness of his own crew to approach those dangerous rocks being the only reason which prevented him from making the discovery which fell to Captain Snow's lot five years later.

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[1] These natives, viz, Gregori Kichin, a Russian "creole," born 1843 in Sitka, and Simon Stepanof, born on the island of Akha, both now living on Copper Island, told Captain Moser and myself in 1896 that in 1877 they had themselves seen the rookery on Srednoi. They had, however, only counted 50 to 100 seals with young, but as they could not specify the time it is quite possible that they visited the rock before the bulk of the seals had hauled out. Kichin was with Sandman in 1881.

[2] Sandman, in conversation with me in 1882, attributed his failure to see the seals to the fact that they were on the side of the rock opposite to where he was with his vessel (see my Russian Fur-Seal Islands, p. 59), but Captain Snow is rather inclined to believe that he was there before the seals had arrived, since when he himself landed on Srednoi in 1881 not all the seals had hauled out yet. The Kuril seals, according to Snow, are later in hauling out than those on the other rookeries.

It is also highly probable that volcanic phenomena have something to do with it. It would seem as if the Kuril Islands were formerly subject to more violent and frequent eruptions than at present, which may have tended to keep the number of seals at a low ebb. Thus Pallas (Neue Nord. Beytr., IV, 1783, p. 127) gives an account of Raikoke, based upon Shebalin's observation of the eruption in 1780. A large quantity of stones and ashes was thrown out, filling up the coves and beaches. It is added, however, that "the sea lions are common there, nevertheless, and bring forth their young, though neither men nor birds can inhabit this new volcano." It is pertty safe to say, however, that the fur seals would have a pretty hard time of it at a place where not even the birds could live.

DISCOVERY AND LATER HISTORY OF THE ROOKERIES.

I have just related how Captain Petersen, according to his own statement to us in 1896 in Yokohama, came pretty near being the first discoverer of Srednoi rookery, and consequently the Kuril Island rookeries, and that the prize instead fell to Captain Snow.

The latter, during our recent visit to Japan in order to secure information in regard to these points, told the story of the discovery to Captain Moser and myself, and the following account is mainly based upon the narrative of the genial explorer of the Kurils, who, now the seals are all gone, was quite willing to have the facts made known. A few points have also been obtained from Captain Petersen and from various statements to be found in the fur seal arbitration case. In nearly every instance, however, the latter are involved in great confusion concerning the years, and as they are all simply based on memory they can not be taken into account when conflicting with statements by Mr. Snow, which are based upon contemporaneous written notes.

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[1] See my Russian Fur-Seal Islands, pp. 54, 55; ante, p. 73, 74.

[2] There is positive record of the fact that the native Kurilians in the ante-Russian days went to these uninhabited rookery rocks for the purpose of killing the animals inhabiting them. In Pallas's account of the Kuril Islands (Neue Nord. Beytr., IV, 1783) it is expressly said that the Kurilians from the Seventh Island (Shiashkotan) and other islands were in the habit of repairing every summer to the Mushir Rocks in order to kill the young sea lions which are born there in June.

a. SREDNOI ROOKERY.

It was in the summer of 1881 that Captain Snow, while on a sea-otter expedition in his schooner, the *Otome*, came across the rookery on Srednoi Sea Lion Rock, which Sandman had just missed. When landing, he and his men found the seals utterly fearless of them and they had to kill right and left to gain a foothold. The seals were clubbed and skinned right there on the breeding ground. No sex or age was spared and gradually the seals got shyer and went into the water, but the men had only to conceal themselves and wait a little behind some rock and the seals would soon come back. A little space having been now cleared the seals to be killed could be driven away from the others, and so the killing went on without disturbing the rest. Two thousand five hundred skins were thus secured, when the salt gave out. With his precious cargo Captain Snow hurried back to Hakodate, laid in a new supply of salt, returned to Srednoi and secured 2,500 more. In the meantime the natives of Ushishir had also visited the rock and killed about 1,000 seals, but being obliged to leave before they had been able to care for the skins on account of a storm coming up, the skins had been ruined. Finally, late in the season the schooner *Kira Elizabeth*, belonging to a man called "Russian Johnson," arrived and took 1,700 skins, having obtained the information as to the location of the rookery by two of Snow's men who deserted in Hakodate. Altogether, therefore, at least 7,700 seals were killed that first year on Srednoi Flat Rock.

Snow went to England on a visit the next year, but too many now knew of the existence of the rookery. No less than seven schooners proceeded to Srednoi in 1882. The only way to work it was to combine. They consequently anchored up, went to work, and divided the catch, each vessel getting 600 skins as its portion of the booty. Thus over 3,200 seals of all classes were killed on Srednoi during the second year.[1]

Just how many were killed on Srednoi in 1883 may probably never be known exactly. It seems that only Japanese visited the rock that year. Captain Snow writes me (January 28, 1898) that "no seals whatever were taken on Srednoi in 1883 by foreign schooners, as some 25 Japanese were established on the rocks close to the rookery all through the season, and they killed everything that hauled up, securing 400 for the season." He himself called there twice that year—at end of June and during the first week in July.

In 1884 less than 700 skins were taken, by four schooners, as seen by the specified statistical table given later on.

Srednoi was now "practically cleaned out," for only 12 skins were obtained there the next year, 1885, by Snow, and the rock does not figure in the annals of Kuril Island raids until 1889, when 38 skins were obtained there. In 1890 it appears to have recovered sufficiently to allow the *Suisan Kaisha*, the legal licensee, to club 200 seals, the last large killing done on this rock.

A few seals linger around the old home yet. Some Srednoi seals have been killed there by the *Suisan Kaisha's* people during recent years, thus in 1891 20, and in 1892 3. One seal was killed there by the crew of the *Chishima Maru* between September 26 and November 13, 1893 (according to Mr. Nozawa, in letter), and 5 seals were seen in the water at Srednoi by Mr. Nozawa's assistant, who visited the rocks during the same year.

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[1] E. P. Miner says that eight schooners exploited Srednoi that year. He does not remember the number of seals they got, only that there were 1,000 in the first drive. (Fur Seal Arb., VIII, p. 701.)

The people of the *Yakuno Maru* claimed to have taken a few black pups there the same year and to have seen one seal on the rock the very morning when I myself landed there in 1896 and found none.

b. Mushir Rookery.

The history of the discovery of Mushir rookery is not so clear. Captain Snow states that the schooner *Helena*[1] in 1881, the same year in which he discovered Srednoi, obtained 50 seals on Mushir. However, the first great haul was made the following year (1882) by the schooner *Mary C. Bohm*, the number of seals taken being 1,240, according to Snow.

No other schooner seems to have exploited Mushir that year, as Srednoi was all they could attend to. It should be noted, however, that E. P. Miner, who was that year in the *Otome*, states that "we worked both rookeries [Mushir and Srednoi] that summer [1882]" (Fur Seal Arb., VIII, p. 701).

The foreign schooners did not exploit the Kuril rookeries to any extent in 1882, as they devoted all their energies to sea-otter hunting and to raiding Robben Island. Captain Snow assures me that the only foreign vessel which obtained skins in the Kurils that year was the *Penelope*, which secured 87 seals on Mushir in July, 1883. Snow himself called at the rock just after this occurred. "For some reason or other," he writes me, "the Mushir rookery (which is on a high peaked rock, and difficult of access except in very fine weather) was only visited by the few of the hunters, who, arriving soon after the *Penelope* had cleared off the seals, found nothing worth remaining for."

Mushir rookery was not exhausted, however, probably due to the greater difficulty in landing and working the Seal Rock, for in 1884 at least 1,758 skins were obtained there. Petersen, in the *Diana*, took 960 seals there, and the *Nemo* got 400. E. P. Miner, then mate on the *Penelope*, on his return from the north, got "a few seals on the Mushir Rocks" (Fur Seal Arb., VIII, p. 702), 30 according to Snow. The *Adele* got 118 and the *Felix* 250.

It seems that Snow, in the *Nemo*, and Petersen, in the *Diana*, were the only ones who visited Mushir in 1885, but the catch was small, only 384 and 107, respectively; but this nearly exhausted the rookery, for in 1886 the *Diana* only got a doubtful hundred on "Mushir, Raikoke, etc." During later years only a few unrecorded individuals have been taken there, not separately enumerated in the catches; thus Miner states that in 1886 he visited Raikoke Island, Mushir Rocks, and Srednoi, "but got only about 500 seals" (Fur Seal Arb., VIII, p. 702).

Since then nothing authentic is heard of Mushir rookery until 1893, when the *Chishima Maru* took 3 seals there on September 19 (according to Mr. Nozawa's statement in letter to me of November 2, 1896), and Mr. Nozawa's assistant saw 10 seals in the water near it, except the general statement of Mr. Niva that until about 1892 the *Third Chishima Maru* killed there about 30 to 40 seals every year. More definite is his account of the killing of four old males weighing 300 to 400 pounds, according to his oral statement to me in Tokyo in 1896, which were taken on the west side of Sea Lion Rock on September 11, 1894, when he was cruising in the same vessel (Rep. Jap. Fish Bur., 1894, pp. 201–202).

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[1] This is probably the German schooner *Helena*, Captain Golder, which was seized by the Russians in 1884 at Robben Island, it having "raided that island five years." (See my Russian Fur-Seal Islands, p. 57.)

The last account of seals on Mushir is the statement made by the skipper of the *Yakuno Maru*, Captain Sagiro, to us at Ushishir in 1896, that he had seen a single one a few days previously (August 24), consequently about simultaneous with my own visit there when none were seen at all.

c. RAIKOKE ROOKERIES.

I have mentioned above (p. 252) that Captain Snow came near being the discoverer of one of these rookeries in 1883. However it was not until 1885 that Capt. E. P. Miner, of Seattle, in the *Penelope*, made the lucky hit, though Captain Petersen, of the *Diana*, claims to have given Miner the information and to have taken 600 seals himself there that same year.[1] Snow's figures for 1885, year's slaughter on Raikoke do not include these, but allow 3,700 for the *Penelope*,[2] 300 for the *Felix*, and 2,000 for a Japanse schooner;[3] a total of 6,600 seals killed in one season. These were probably all taken on the west rookery, as according to both Snow and Petersen the one on the east side was only discovered later.

Captain Miner's own account is as follows:

> In 1885 I went out as master of the *Penelope* and discovered a new rookery on Raikoke Island, one of the Kuril group. We got about 3,500 skins there. I had not enough salt to cure more and went to Yokohama. When the news spread several other schooners went to this rookery and frightened the seals away; 1,600 was, I think, the most any one got. We went back there again from Yokohama, but the other schooners had been ahead of us and we got nothing. * * * In 1886 I was again master of the *Penelope* and visited Raikoke Island, Mushir Rocks, and Srednoi, but got only about 500 seals (Fur Seal Arb., VIII, p. 702).

This great slaughter had evidently an immediate effect upon this rookery, for the figures given for the next year scarcely allow 1,000 for Raikoke, while in 1887 this island only comes in for a similar figure, a few of which may even have been taken on Srednoi and Mushir. Eighteen hundred and eighty-eight shows only 9 seals taken on Raikoke by the *Diana* and 6 in 1889 by the *Nemo*. During the following years some of the few dozen skins obtained "here and there" in the Kurils by the Suisan Kaisha have come from Raikoke, thus apparently 179 in 1890 and 24 in 1891. We may possibly look upon the 300 claimed by the skipper of *Yakuno Maru* to have been taken by him in 1892, and the 60 in 1893, as the result of an increase due to a few years' rest,[4] during which year Petersen is said to have got 37 there in the *Diana*. That some are left is shown by the fact that he took 12 seals, 3 bulls, and 9 3-year-old ones, among the rocks and caves on the east side on August 19, 1896, a few days before I visited the place. When I add that Mr. Nozawa's assistant saw 6 seals there in 1893, the accessible records relating to this island are exhausted.

d. MAKANRURU ROOKERY.

It is doubtful whether the aggregation of a few breeding seals can be properly designated as a rookery, yet it is here treated separately for the sake of completeness.

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[1] Snow refers these 600 skins to Robben Island.

[2] Miner himself says "about 3,500 skins."

[3] It is possibly to this latter catch that the figures for 1885 given to Mr. Nozawa by the Ainu hunter refer (see further on p. 258).

[4] According to Mr. Nozawa (in letter) the *Chishima Maru* took 3 seals on September 23, 1893.

Snow has estimated that in all about 150 skins have been taken there from time to time.

He, in the *Retriever*, seems to have been the first to have made any catch on this island, having taken 6 seals there in 1893, though it is quite possible that it was previously raided by unknown parties. It was, of course, the custom of raiders to keep as quiet as possible about new discoveries of that kind, in order to preserve the knowledge for themselves as long as possible. It is not improbable that the rookery was known to the Suisan Kaisha people, who, in the *Third Chishima Maru*, took 2 males, 3 females, and 3 pups there early in August, 1895. These must have been nearly all, as Mr. Kitahara, who landed there on August 10, found none.

ESTIMATE OF NUMBER OF SEALS ON THE KURIL ISLANDS ROOKERIES WHEN DISCOVERED.

Mr. Snow has estimated the number of seals on the Kuril Islands rookeries at their discovery in 1881 to have been from 12,000 to 15,000 each on Srednoi and Raikoke; about 2,000 on Mushir, and "a few hundred only" on Makanruru. For the two first mentioned islands this seems to be a rather high estimate, judging from the number of seals which are said to have been taken on them. Allowing in every instance the highest figure claimed, and allowing also all which have been doubtfully alleged to have been taken on the Kurils, the total number of animals killed between 1881 and 1896 scarcely reaches 25,000, while the above estimate provides for about 29,000 big and small seals in 1881, without allowing for the natural increase which must have gone on, however much decreasing, nor for the number of seals which must of necessity have been at sea when the rookeries were discovered. Noting, moreover, that Mr. Snow did not see the Raikoke rookery until after the big raids of fully 6,000 in 1885, and that more than 3,500 seals were taken on Mushir between 1881 and 1885, we believe ourselves justified in modifying the estimate so as to provide for an original population actually on the rookeries in 1881 somewhat like this: Srednoi, about 12,000 seals, large and small; Mushir, about 3,000 seals, large and small; Raikoke, about 7,000 seals, large and small; or about 22,000 seals on the Kuril Islands, all told.

NUMBER OF FUR SEALS KILLED ON THE KURIL ISLANDS.

The exact number of the seals taken on the Kuril Islands may probably never be known. Until quite recently only the vaguest possible statements were available, and these often highly divergent. The authorities of the Fisheries Bureau of the Hokkaidocho, located at Sapporo, have of late endeavored to get at the facts and have for that purpose obtained statements from some Aino hunters who had taken part in the early raids and expeditions to the Kurils. Mr. S. Nozawa, during our visit in Hakodate in 1896, kindly translated from a manuscript report of his relating to the subject, but I am sorry to say that the figures and details given by his informants are totally at variance with the facts and completely worthless. True, it was expressly stated that no attempt had been made to discriminate between the Robben Island and the Kuril Island catches, but even with that proviso it is plain that the Aino in question, intelligent though he may have been, as we are assured, had no idea of the real significance of the big figures he handled,[1] or else his dates are sadly out.

Knowing that there was really only one man who could furnish the necessary data for a history of the Kuril Island seal rookeries, were he disposed to do so, viz, Capt. H. J. Snow, who both as an active participant and leader in the many expeditions of those early days and as a man of unusual ability, literary and scientific, for the profession he had chosen to follow, I was naturally anxiously awaiting his return to Yokohama from his northern cruise last autumn. Fortunately he not only returned shortly before our departure, but he was quite willing to tell what he knew and to answer the many questions which Captain Moser and I plied him with. He also kindly furnished us with a "Memorandum of seals taken on the Kuril Islands, Robben Island, and St. Iona Island by otter hunting and sealing vessels," which he stated was not quite complete. Since then he has sent me a new memorandum, for which he claims more exactness, having had time to make further inquiries, and from this I publish appended a detailed abstract. The following statement is chiefly based upon this memorandum:

Number of seals taken on the Kuril Islands between 1881 and 1896, based chiefly on Captain Snow's memorandum.

1881.—As related above, Snow, in the *Otome*, took 5,000; the *Kiva Elizabeth*, 1,700, and the natives about 1,000; together, 7,700; all on Srednoi, while the *Helena* took 50 on Mushir....	7,750
1882.—The *Mary C. Bohm* took 1,240 on Mushir. Snow in his memorandum next enumerates 5 schooners as having obtained 600 skins each on Srednoi, and one 250, but in conversation with me he said that 7 schooners in that year had taken about 4,200 skins at that rock. To be on the safe side I, therefore, adopt the smaller figure, or together..................................	4,490
1883.—According to Snow, only Japanese schooners visited Srednoi this year, securing in all only 400 skins; the schooner *Penelope* obtained 87 skins on Mushir. Captain Petersen, the owner of the *Diana*, stated to us, however, that in 1883 he went to Mushir with two vessels, one taking 600 and the other 200 seals, and that 7 schooners exploited Srednoi rocks. As his dates and figures were from memory only, I have not ventured to alter Captain Snow's definite figures..	487
1884.—Five schooners visited the Kurils this year; 690 were taken on Srednoi, and 1,758 on Mushir. According to Snow the *Diana* got 1,250 skins. Captain Petersen himself gave 1,263 as the exact number, making a total of..	2,451

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[1] The statements were, briefly, as follows:

1877.—Seventeen sailing vessels fitted out for the Kurils and secured altogether 16,000 seals. The Aino in question was on board the *Noshinta Maru*, which took 176 seals.

1878.—Fifteen vessels from Yokohama took 7,600 fur seals and 89 sea otters. The Aino was on the *Attenki*.

1879.—Eighteen vessels from Yokohama took 7,000 seals and 47 sea otters. The Aino on same vessel.

1880.—Twenty-one vessels from Yokohama took 6,400 fur seals and 31 sea otters. Aino in *Asac*.

1881.—Twenty-two vessels from Yokohama took 8,600 seals and 43 sea otters. Aino in *Baener*.

1882.—Nineteen vessels took 8,600 seals and 47 sea otters. Aino in *Takesima Maru*.

1883.—Number of vessls and total catch not stated. The Aino was in Mr. Taketomi's schooner (name of vessel not given), which took 262 seals and 2 sea otters, all of which were confiscated by the Government for illegal sealing.

1884.—Vessels and catch not stated. Aino in the *Diana;* 2,400 seals, no sea otters.

1885.—Fur seals, 4,564; sea otters, 58; all confiscated by the Government for illegal sealing. The Aino this year went out on his own account, cooperating with other natives from Hakodate.

It is possible that the above figures also embrace the number of winter skins taken by the natives off the coast of Yezo. At all events, the references to the names of the vessels and the statement of the

1885.—Several schooners, according to Snow, took 6,000 seals on Raikoke; Petersen, in the *Diana*, obtained 107 on Mushir, while he himself got 12 at Srednoi and 384 on Mushir; together	6,491
1886.—Three schooners with 886 seals on Raikoke. The *Diana* is supposed to have obtained some (possibly 100) on Mushir, Raikoke, etc	986
1887.—The *Diana* is said to have obtained 401 seals on Raikoke and the *Rose* 520	921
1888.—Only 9 skins are on record for this year, having been taken on Raikoke by the *Diana*	9
1889.—The record slightly better, two schooners obtaining 44 together. The 36 skins taken by Japanese schooners are those obtained by the Suisan Kaisha, and the figures are official	44
1890.—Only the schooners of the Suisan Kaisha seem to have obtained skins on the Kuril Islands, the official figures being 379	379
1891.—The same remark applies to this year	44
1892.—Suisan Kaisha only got 3 and the *Diana* obtained 37 skins on Raikoke. Sagiro Kwata claims to have taken 300 on Raikoke; say	340
1893.—The *Retriever* secured 6 on Broughton, Sagiro Kwata claims to have killed 60 on Raikoke, and the Suisan Kaisha obtained 9 "here and there" on the Kurils, of which 3 were taken on Mushir, September 19; 3 on Raikoke, September 23, and 1 on Srednoi between September 26 and November 13 (Nozawa in letter)	75
1894.—According to the official report of Mr. Niva in the *Third Chishima Maru*, that vessel killed 4 males on Mushir on September 11 (Rep. Jap. Fish. Bur., 1894, p. 202)	4
1895.—Sagiro Kwata got "a few" on Broughton, possibly the same 8 found there by the *Third Chishima Maru* early in August (Rep. Jap. Fish. Bur., 1895, p. 146)	8
1896.—The only ones taken this year seem to have been the 12 obtained by the *Yakumo Maru* on August 19	12
Total	24,491

HOW MANY FUR SEALS ARE LEFT ON THE KURILS?

The question has been asked: How many seals properly belonging to the Kuril Island rookeries are still left?

It is a hard one to answer in a definite way, yet it is easy to fix a maximum. As related before, during a careful inspection in 1896 of the rocks where the seals used to breed, I myself did not see one, though I am willing to believe that a few may yet be left which were at sea somewhere. We have, however, asked other people the same question, who were there the same summer, and who have been there every year for many seasons, and all agree that there are yet a few left. How many? A hundred? No; decidedly not. Fifty? Possibly. Thirty? Hardly more.

CAUSE OF THE EXHAUSTION OF THE KURIL ISLAND ROOKERIES.

In fifteen years the rookeries which we have conservatively estimated at nearly 25,000 seals have been reduced to scarcely more than 30 individuals, all told.

And the cause? Indiscriminate slaughter, wholesale at first, then in rapidly dwindling numbers, but what is of importance, unremittingly and with no trace of or pretense at protection. Robben Island offers an interesting parallel and yet a

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Government having confiscated certain catches may lead somebody on the track of the mystery, and for that reason the statement has been reproduced here.

Mr. Nozawa also presented another account, also by an Aino, but which he distinctly stated to be unreliable, to the effect that "clubbing took place chiefly between 1877 and 1882; that during that time 5,000 to 10,000 skins were taken *annually by one vessel*, gradually decreasing to 400 to 500 per vessel, the whole catch since 1883 being about 10,000 a year." Of course this statement is simply ridiculous.

contrast quite instructive. The seals on that lonely rock have been persecuted quite as unmercifully as those on the Kurils and the slaughter has been quite as indiscriminate at times. Yet, although terribly decimated, there remains a small but compact herd, which if left alone by the raiders and properly managed by the owners might yet be made remunerative in a comparatively short time, as proven by previous experience. And the cause? The protection extended to these seals during the breeding season, scant though it has been, is the only cause which has prevented the extinction of the Robben Island seals, not commercially only, but literally.

The important lesson is *that protection does protect.*

CAN THE KURIL ISLAND ROOKERIES BE RESTORED?

It has been asked next: Would it be possible to rehabilitate the Kuril rookeries?

Of course, as long as a single pair belonging to the rookeries are still alive and are properly protected there is a remote possibility for the reestablishment of the rookeries some time in the future, and the greater the number of pairs or harems left the greater would be the probability. I might even go so far as to assume the existence of a certain number of females at the present moment, and upon this assumption and the further assumption of a certain birth rate and death rate, figure out and demonstrate graphically in which year there ought to be so and so many thousand seals again on the Kurils. It would look pretty, but I don't know that it would serve any practical purpose, and therefore shall not attempt it. All I shall venture to say at present is to affirm as my opinion that with proper protection the rehabilitation of the rookeries on the Kurils is a possibility.

But will it pay? That depends entirely upon the kind of protection which could be effectively extended to the seals. Were it necessary to station men-of-war, revenue cutters, or military guards to ward off the poacher, surely it would not pay. But, if seal poaching and marauding could be prevented by a system of international custom measures and internal police regulations properly executed, by which it would be impossible to possess or dispose of an illegally procured seal skin, then it might become profitable to keep a watchful eye on the Kuril fur seals.

III.—PELAGIC SEALING IN JAPANESE WATERS.

BEGINNING OF PELAGIC SEALING ON ASIATIC SIDE.

As I have already pointed out in my "Russian Fur-Seal Islands," page 122, *ante*, page 190, pelagic sealing was practically unknown on the Asiatic side of the Pacific Ocean until the summer of 1891, when several American and British Columbian schooners invaded the western portion of Bering Sea, and that it really began in earnest only in 1892, when practically the whole sealing fleet, due to the continued closing of eastern Bering Sea pending the Paris Tribunal arbitration, went across during the summer. But this was not yet pelagic sealing in Japanese waters, as most of the catches during those years were made on the feeding grounds of the Commander Islands.

However, a beginning is said to have been made in 1890, when the *C. G. White*, Captain Hagman, came over and took 680 seals, according to Captain Snow; but as this vessel was also on the Copper Island feeding grounds, and even possibly raided the rookeries,[1] it is doubtful whether all the 680 skins were secured in Japanese waters.

Captain Snow states also that "in 1891 this same vessel again visited the Japan coast and secured nearly 1,700 skins,[2] and further that in 1892 there were 9 vessels which got between them 14,400 seals.

I have myself been able to trace only 8 schooners hunting off the coast of Japan in the spring of 1892, all American, their total catch amounting to less, viz, only 12,064 skins.[3]

I suspect, however, that Captain Snow's figures are nearer the truth, in which case, however, the number of schooners must have been greater.

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[1] See Stejneger, Russ. Fur-Seal Islands, page 122. The actual figures seem to be less, though the testimony varies from 476 seals off Japan and 59 off Copper Island (Fur Seal Arb. Proc., VIII, p. 728) to 550 seals off Japan (probably including 25 on the American coast) and 25 in Bering Sea (Fur Seal Arb. Proc., III, p. 432).

[2] Is this not a confusion with the *C. H. White*, which got 1,687 seals off the Japan coast in 1891? (Fur Seal Arb., VIII, p. 727.)

[3] In the Fur Seal Arbitration Proceedings, VII, p. 407, there is a statistical list of the "Sealing Fleet and Pelagic Catch of 1892," which is incorrect, apparently, so far as the American vessels are concerned, as will be seen by a comparison between the figures of that list and those of the references in my list of the schooners hunting off the Japan coast in the spring of 1892. It will be seen that the Asiatic catch of the United States schooners was at least 16,049, thus reducing the catch on the American side to less than 11,988.

According to the printed documents a ninth schooner should be added to the above list of schooners hunting off Japan in 1892, for in the "Reports of the Condition of Seal Life on the Rookeries of the Pribilof Islands, 1893-1895" (Fifty-fourth Cong., first session, Senate Doc. 137), pt. ii, p. 55, there is found what purports to be an abstract from the sealing log of the "Canadian schooner *Triumph* (Japan coast), Cox, master—1892." But there is evidently some mistake here. The log in question is not that of the *Triumph*, which, in 1892, sealed off the American coast, taking 284 skins on the "Upper Coast" and 257 on the Asiatic side. The log appears, however, to be that of the *Carlotta G. Cox*, William Byers, master, for the year 1893, with a few slight changes (Venning's Report, 1893, p. 104).

List of schooners hunting off the coast of Japan, spring season 1892.[1]

Name of vessel.	Nationality.	Catch.	Remarks.
Mattie Dyer	American	1,190	Fur Seal Arbitration Proceedings, VIII, p. 723.
San Diego	do	2,069	Fur Seal Arbitration Proceedings, VIII, p. 741.
Sophia Sutherland	do	1,608	Fur Seal Arbitration Proceedings, VIII, p. 814.
Bowhead	do	1,830	Fur Seal Arbitration Proceedings, VIII, p. 815.
Kate & Anna	do	1,250	Fur Seal Arbitration Proceedings, VIII, p. 714.
Louis Olsen	do	1,311	Fur Seal Arbitration Proceedings, VIII, p. 732.
Ivanhoe	do	1,294	Fur Seal Arbitration Proceedings, VIII, p. 731.
Allie Algar	do	1,517	Fur Seal Arbitration Proceedings, VIII, p. 707.
Total		12,064	

This indicates that pelagic sealing off the coast of Japan really began in 1892, just previous to its sudden start on the Copper Island grounds.

THREE CLASSES OF PELAGIC SEALERS IN JAPANESE WATERS.

It will be noted, therefore, that pelagic sealing on the Asiatic side is a direct transplantation of the pelagic sealing on the American side. It was started by the same men in the same vessels, employing the same methods and the same implements. Consequently there is but little difference in the pelagic sealing off Japan that requires being gone into specially in the present connection.

There were in Japan, however, two other classes of sealers who soon learned the advantages of the new trade and adopted it, viz, those native Japanese who had already for some time carried on a legitimate sealing business, notably the people of the Suisan Kaisha, and the native population who had been killing seals in winter near the coast on the one hand, and the foreign schooner owners and captains residing in Japan, who for years had made that country the favored home of the raiders.

There are consequently three distinct classes of sealers interested in the Japan seal catch, viz: (1) the American and British sealing schooners coming across from America every spring and returning to America after finished sealing; (2) the schooners owned and officered by foreign residents in Japan, and (3) the schooners owned, mostly officered, and manned by Japanese citizens.

Hitherto the first class has been the most numerous on the sealing grounds, but as the business is gradually becoming less profitable their number is falling off. At the same time the latter classes, particularly the third one, show signs of increase, as they are able to run cheaper and make a profit where the more expensive craft would seal at a loss.

MIGRATIONS OF COMMANDER ISLANDS HERD.

The detailed logs of 39 schooners, from 1893 to 1896, that is, of all that it has been possible for me to collect, enable us to show with considerable exactness the spring migration route of the Commander Islands seal herd on their way to the rookeries, as indicated by the localities, numbers, and dates of seals taken. Incidentally these logs

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[1] Mr. E. J. King, of Hakodate, has recently given me a list including 3 additional schooners and somewhat different figures. These, I believe, have been obtained at the custom-house in Hakodate. The list is as follows:

	Skins.		Skins.
C. G. White	712	San Diego	2,460
Ivanhoe	1,780	Kate & Anna	1,222
Penelope	1,612	E. E. Webster	1,786

furnish us with material for the discussion of various other questions to be touched upon further on.

In a general way the migration of the Commander Islands seals and the consequent movements of the pelagic sealers off the coast of Japan has been pointed out by Mr. Chas. H. Townsend (see my Russian Fur Seal Islands, p. 62, and maps accompanying the report on the fur seal fishery for 1895, Senate Document 137, Part II, 54th Congress). The question will bear some elaboration, however, and may be stated as follows:

A glance at the accompanying map (pl. 113), which shows the density of the catches off the coast of Japan of no less than 39 schooners, will convince us that the seals are not scattered evenly over the vast area of approximately 125,000 square miles, but that there are centers around which they appear to be massed more closely together. There are thus apparently two such centers between 36° 30′ and 37° 30′ north latitude, one about 60 miles from shore, the other more than 200 miles. In latitude 40° there are two, or even three, such patches, respectively about 50, 150, and 270 miles from land. In 41° there are again two smaller centers, while between 41° and 42°, practically in the Gulf of Mororan (or, as it is called by the sealers, Volcano Bay, a name, however correctly, referred only to the inner bay of this gulf, in which seals are but scantily taken), the seals seem to congregate in great numbers. To the northeastward along the coast of Yezo, averaging 20 to 30 miles offshore there are several centers of less magnitude off the island of Iturup.

It will be noticed that practically no seals are taken south of latitude 36° or north of latitude 46°.

This distribution is pretty well understood by the sealers, a fact of which I became cognizant in plotting the logs in question, and Captain Snow has given the following explanation:

> Uncertain and conflicting currents, often running from two to three knots in opposite directions, prevail on the sealing grounds (off Japan). These currents vary in temperature in places as much as 30° F. The sea hereabouts appears to be split up into alternate belts of warm and cold water of variable widths. To pass from one streak of current of a temperature of 60° or 65° to another of 35° or 40° is common during the spring months. The edges of these currents are clearly defined, the waters being of different colors, with always more or less of a rip along the margins. The seals keep mostly in the cold streams, few being found in water where the temperature exceeds 54°.

It seems that these centers of density of the seal catch to some extent denote the feeding and resting stations of the Asiatic seal herd on its travels northward. The movement itself could not be shown on the map in question (pl. 113), but it is well indicated on Townsend's maps quoted above. It appears, then, that in normal years up to the latter part of April the seals are chiefly found south of the fortieth parallel. At the beginning of May the seals commence to crowd the Gulf of Mororan, between Hondo and Yezo, and for nearly three weeks they are assembled here, during which time the heaviest damage is done to the herd. Toward the end of May the seals move northeastward along the coast of Yezo, comparatively near land, making a last stand to the east of Iturup about the middle of June. From that neighborhood they suddenly disappear and do not seem to stop in their rapid northeastward course until they reach the breeding grounds on the Commander Islands.

Such is the movement in normal years. Occasionally, however, unknown causes, but probably of meteorologic or hydrographic origin, may accelerate or retard it, as, for instance, in 1893. During that year the seals seem to have started north quite early, but to have become checked in their progress, so that we find them massed during the entire April, May, and part of June offshore east of Miako, on Hondo, between latitude 39° 30′ and 40° N., and the schooners do not seem to have made any catches of importance in the Gulf of Mororan during that year. This lateness of the sealing season of 1893 is very well shown in the diagram *a* on plate 112, which proves it to have been from one to two weeks behind the normal.

CONDITIONS OF PELAGIC SEALING OFF JAPAN.

As I have already pointed out, the pelagic sealing on the Asiatic side is a direct transplantation from the American side, the methods being in nearly every respect identical. There is one difference, however, due to the Paris tribunal award, viz: that on the American side the spear is used extensively in the capture of seals, while on the Asiatic side the shotgun is used exclusively.

The restriction upon the shotgun or rifle was placed by the arbitration tribunal for the protection of the seal, but it is certain that the result has been quite the reverse. In the early days of pelagic sealing on the American side—that is, before 1892—the gun was almost the only weapon used by the pelagic sealers. The result was that the seals, from the continued shooting, were becoming shyer and shyer all the time. The sealers, therefore, when in 1892 they commenced to hunt the Commander Island seals, were much surprised to find them very tame and unsuspicious. It is curious to read the testimony of the arbitration case and see how the sealers when asked about the alleged difference between the American and the Asiatic seals would refer to the tameness of the latter as a distinctive character. The case is exactly reversed now. In 1896, in attempting to account for the falling off in the catches on the Asiatic side, the sealers gave as one of the chief reasons that the seals were so wild that a boat could not get near them. The use of the gun has now made the Asiatic seals as wary as the American seals were formerly, and while during the first year the gun caused greater damage among the seals, its continuance is distinctly to their advantage. It is to be hoped that the spear may not come into use on the Asiatic side.

While the methods in the past on the two sides have been practically alike, the conditions are in some respects very different. I have in my possession some notes on the pelagic sealing in Japanese waters by Capt. H. J. Snow, than whom no man has any more thorough experience in this matter, which will illustrate this feature better than anything I could say. I consequently take the liberty to quote him, as follows: "On the Asiatic side of the North Pacific the hunting season begins about the 1st of March. One or two vessels have ventured out in January and February, but the weather on this side during these months is so boisterous that hunting was impossible; they were driven back to port with smashed boats and other casualties. The weather on the American side is much better. The losses of vessels on the sealing grounds there have been very few, and it is seldom that a boat's crew disappears, while on the Asiatic side, particularly off the Japan coast, the casualties have been many and serious. *Nearly 10 per cent of the vessels and over 10 per cent of those engaged in sealing off Japan side of the Pacific have been lost during the season of 1894.*

"Sailing vessels leaving British Columbia or San Francisco for the Asiatic side leave port about the end of December. On account of the prevailing winds at this season, when crossing the Pacific they sail toward the Sandwich Islands, some passing to the southward of them before standing over toward the Japan coast. The passage generally takes from forty-five to sixty days. Quite a few of the schooners call in at the Bonin Islands to replenish their water and lay in a stock of fresh vegetables, etc., while others put into Yokohama for the same purpose, before commencing the season's hunting.

"By the 20th of June the hunting off the Japan coast is practically over, and some of the sealing fleet now start for home. Others put into the port of Hakodate to ship their catch and get a fresh supply of water and provisions previous to sailing for the Copper Island grounds, which are generally reached about the middle of July or a little later."

The above was written in 1894. Since then the feeding grounds off Copper Island have become nearly exhausted, and during the last couple of years but few of the foreign schooners have hunted there. A few have exploited the Bering Island feeding grounds, but the majority have sailed directly for Unalaska, after having first shipped their spring catch at Hakodate.

"On the Asiatic side there have been more losses and accidents to sealers during the past two seasons (1893 and 1894) than on the American side since pelagic sealing commenced, some ten years ago. The Japan coast has proved particularly fatal to sealers. The weather is treacherous and strong, uncertain and conflicting currents, often running from 2 to 3 knots per hour in opposite directions, prevail on the sealing ground." Then follows the remarks on these currents already quoted, page 263. "Where these currents meet heavy rips occur, in some of which at times it is impossible for a boat to live. Over the area where these belts of warm and cold water are found local storms, often of considerable violence, are experienced.

"These currents are the chief cause of the loss of so many boats. When hunting in calm weather, the boats venture far away out of sight of their vessel, passing, probably, into a belt of current, setting in the opposite direction to the one the vessel is supposed to be, steering the opposite course to the one pursued since leaving the vessel; no sign of her is seen after running the proper distance, the currents, during the time the vessel has been lost sight of having altered the relative positions of boats and vessel many miles. Night comes on, and the vessel and her boats probably get farther apart. The next day is spent in trying to find the vessel. If she is not found, a start is made toward the nearest land in hopes of reaching it, or being picked up by some other sealing craft before bad weather comes on. Often it is but one boat of a set that gets lost, but on some occasions three, or even five get adrift from their vessel. The writer had an unpleasant experience of this kind during the past season (1894), he and five of his boats being lost from his vessel some 300 miles away from the nearest land.[1]

"At least 60 or 70 boats were lost from their vessels during the season of 1894 off the Japan coast. The greater number of these were picked up by other schooners, or made the land, but half a dozen or more have never since been heard of. The schooners *Retriever*, *Hermann*, *Agnes McDonald*, *Ocean Belle*, and *Anaconda*, each lost a boat's crew by capsizing and drowning.

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[1] Captain Snow himself was picked up by the American schooner *Bowhead* on the morning of the sixth day. The crews of the other boats were picked up by the *Mermaid* on the morning of the third day.

"The losses, unfortunately, this season (1894) have not been confined to boats, some schooners having been lost with all hands, and one wrecked on Taroke Island, off the east coast of Yezo, with no loss of life. The schooner *Mascot*, of San Francisco, was lost by capsizing in a violent gale in February. The *Matthew Turner*, also of San Francisco, met with a similar end on the 24th of April, during a gale of hurricane force. The schooners *Fortuna*, *San Diego*, *Unga*, and *Mary H. Thomas* are also supposed to have met with a like fate, for they have never been seen nor heard of since they reached the hunting grounds, in the early part of the season.

"1893 was not so fatal to vessels on the Japan coast, one only, the steam schooner *Narwhal* being lost on Ku-saki when starting out from Yokohama early in the season. Quite a number of boats, however, were lost, and several men were washed overboard during gales. The schooners *Umbrina*, *Anaconda*, *Louisa D.*, *Webster* (2 boats), *Walter L. Rich*, *Arctic*, and *Fawn* (canoe) lost boats and crews drowned, the two latter on Copper Island grounds."

Captain Snow also mentions several cases in which boats were smashed by killer whales, and men were killed or drowned, such accidents having happened to the *Libbie* and *Bowhead*, and the *C. G. White*. He also narrates how the *Mermaid* in 1893 was so badly damaged by being struck by the tail of an immense whale that she had to run for Yokohama where she was docked and repaired.

PROPORTIONATE NUMBER OF SEALS SHOT AT AND SKINS SECURED.

Captain Funcke's log (of the *Golden Fleece*) for 1896, extracts of which are given on p. 276, is very interesting in several respects. By a very fortunate mistake he understood the phrase "number of seals shot" in the ninth line of the Official Sealing Log to mean "number of seals shot *at*" and, consequently, he entered the number of shots fired at seals during the day. The difference between this figure and the number of seals obtained gives the misses. From the general testimony of the sealers it has become pretty commonly accepted that in shooting with shotguns the seals "lost" only amount to about 5 per cent, or in extreme cases to 10 per cent of the total number. But the actual figures as uncontestibly proven by the daily entries are very different indeed. Out of 1,367 seals shot at only 1,084 were actually secured, or in other words the misses are a little over 20 per cent of the total number. That this is not a case of uncommonly bad shooting is shown by the fact that the catch was a comparatively large one, and still more by the same percentage obtaining during both seasons, as otherwise the increased practice of the hunters would have reduced the number toward the end. But if we look at the log, we will find that during the spring cruise 974 were shot at and only 769 secured, or about 21 per cent lost, while during the summer cruise 393 seals were shot at and 314 secured, or 20 per cent lost. Even during the last month (August) the loss is over 19 per cent (277 shot at, 224 secured).

Upon my recommendation Captain Funcke continued in 1897 to note daily the number of seals *shot at*, and the result is even more unfavorable than in 1896. During the spring season off Japan 866 seals were fired upon, but only 636 skins secured, which means that the misses amounted to about 36 per cent of the total number of seals killed.

Of course, it is not intimated that all of the seals fired at were mortally wounded, but from the nature of the hunt and the weapons used it is safe to say that the majority must have been hit and wounded more or less severely.

The other respect in which Captain Funcke's log is very instructive is in regard to the relative number of the males and females killed during the migration and on the feeding grounds off the rookeries. Although Captain Funcke secured 797 seals during the migration, of which 497 were males and 300 females, while on the feeding grounds off the rookeries during July and August he obtained 54 males and 243 females, 297 altogether. In other words, the proportion of males taken *during the migration* to the number of females was *5 males to 3 females*, while *on the feeding grounds* the ratio was *2 males to 9 females*. The latter proportion agrees well with the experience of most other sealers, but the preponderance of males in the spring catch is not necessarily to be taken as the normal condition. Whether a sealer during the migration falls in with males or females depends largely upon accident, as is well exemplified by Captain Funcke's entry on May 21, when he took 19 males and 4 females: "8 p. m. spoke the British sealer *Pioneer*. Captain Baker reports having got 35 seals, with one boat yet out, having hunted in sight of us and having about 20 large cows in his day's catch, while our seals were nearly all young males and small cows."

As another good example of this character I may mention the experience of the American schooner *Elsie* off Japan during the spring migration, 1897. The proportion of the total catch was 2 males to nearly 5 females. During the two days, May 11 and 12, however, the catch consisted of 88 males and 31 females, or over 5 males to 2 females, while on the very next day (May 13) the proportions were reversed to 1 male to nearly 20 females.

In a general way, Captain Funcke's experience in 1897 was similar—that is to say, he obtained more males than females during the migrations, while the number of males to females on the feeding grounds was about as 1 to 4. The preponderance of males in the spring catch, however, was very slight and goes to further corroborate the above statement that the proportion between the sexes, as secured during the migration, is greatly influenced by accident.

TABLES OF CATCHES, 1890-1897.

The detailed figures of the entire Asiatic pelagic catch is given in my Russian Fur-Seal Islands, 1741-1897, *antea*, pages 122-132. The following extract relates exclusively to the spring catch off the coast of Japan.

Year.	United States.	Canada.	Japan.	Total.
1890	476	....	....	476
1891	1,687	....	....	1,687
1892	12,064	....	....	12,064
1893	24,320	30,617	....	54,937
1894	[illegible]	48,993	965	83,675
1895	[illegible]	18,687	4,684	34,672
1896	4,649	17,968	3,461	26,078
1897	1,273	7,321	4,414	14,463
Total	39,487	123,586	13,524	228,052

The average catch per vessel in these years can not be ascertained with absolute certainty for some of the years on account of deficient returns, but from 1892 to 1897 we know the average catch for a certain number of vessels to have been as follows:

Year.	Number of vessels.	Average per vessel (skins).
1892	8	1,508
1893	53	1,609
1894	70	1,023
1895	36	833
1896	36	628
1897	30	482

This table is graphically illustrated by the broken line in diagram *b* on plate 110.

It will be noted that the average for 1892 is only based upon the catches of 8 vessels and that their average is somewhat less than the average in 1893. But the latter circumstance is easily explained by the fact that it was the first serious attempt at pelagic sealing in Japanese waters. When we consider that the sealers were almost entirely inexperienced it is simply remarkable that they could average 1,508 skins per vessel, and it becomes quite certain that if they had been as well posted that year on the movements of the seals as they became afterwards the average would have been considerably higher than in 1893.

Apart from this apparent increase in 1893 we find *a large and steady decrease* in the average catch per vessel, in spite of the fact that the sealers became more and more experienced both as to the movements of the seals, the handling of the schooners, and the use of the guns.

I wish to call attention to and emphasize the exceedingly large decrease as early as 1894, which, on the other hand, was the most successful sealing year so far as the total number of seals are concerned, showing as it does that the very first year of *wholesale* killing of pelagic seals, viz, 1893, was followed by a startling decrease in the average catch, which has continued ever since.

ANALYSIS OF PELAGIC SEAL CATCHES OFF THE COAST OF JAPAN.

In order to fully understand and illustrate various phases of the pelagic sealing I have spent a great deal of labor and care in constructing a series of tables and diagrams (pls. 110–112) which are intended to illustrate graphically the progress of the catch and its surrounding conditions for each week of the spring season.

These tables and diagrams are based upon the log entries of 39 schooners, which are found rendered in detail at the end of the chapter on pelagic sealing. These 39 logs are all which I have been able to collect, but the number is large enough to secure permanent averages from which reliable conclusions can be drawn.

The diagram showing the total number of seals taken by the 39 schooners whose logs we possess (pl. 112, fig. *a*) demonstrates several interesting facts: First, that the great bulk of the skins were taken between the middle of March and the middle of June; second, that the season of 1893 was from one to two weeks behind that of the other years, and third, we observe that, whether the season be early or late, there are four distinct maxima, the first being normally about April 1, the second about April 20, the third near the end of the first week of May, and the fourth toward the end of May and the beginning of June.

Now, turning to diagram *b*, on the same plate, giving the total number of days during which the same 39 schooners have been hunting, we are struck by the general similarity between these lines and those of diagram *a*. We note here also four distinct maxima, which in time correspond pretty well with the maxima of catches, and that the hunting day maxima of 1893 are one to two weeks behind those of the years 1894–1896. This correspondence between the lines in the two diagrams is evidently more than a coincidence, and as the number of hunting days per week is chiefly due to the weather it is tolerably clear that the cause of the lateness of the seal catch and the seals in 1893 was due chiefly to some backwardness of the meteorologic or hydrographic conditions which influence seal life.

On plate 111 is given a diagram showing the average catch per hunting day for each week of the spring season from 1893 to 1896. It is gratifying to find that the lines which are based upon the few (39) vessels from which we possess detailed returns in their totality agree with the averages per vessel previously given for the entire fleet (p. 267 and pl. 110). It will also be noted that there are certain maxima for the average catch per vessel which in the main agree with the maxima for the total catch, if we only remember that the sudden rises and falls of the lines at both ends of the diagram are due to the fact that at the beginning and at the end of the season only a few vessels are sealing and that a few lucky catches result in great fluctuations of the averages. This diagram, besides proving more in detail that the seals are decreasing, seems to indicate that the catches during May—that is, during the time of the stay of seals in the Gulf of Mororan—have been decreasing proportionally less than farther south. The explanation of this is easy if we look at the density chart, plate 113. It will be seen that the gross of the seal herd in the locality mentioned is confined to a much more restricted area; in other words, that they are less widely diffused and consequently more easily taken at that particular time and that particular place. The greatest damage to the herd during late years is done then and there.

Before closing it may be well to again cast a glance at the diagrams on plate 110, especially diagram *b*, showing the average catch per vessel in Asiatic waters, in order to get an idea of the comparative importance of the spring catch off Japan and the summer catch off the Russian islands. It will then be seen that the overwhelming number of skins are taken during the migrations and that *so far as numbers alone are concerned* the damage on the feeding grounds appears comparatively slight. From the sealer's standpoint, consequently, the "Copper Island grounds" are very unimportant. When it is remembered, however, that the catch on the latter consists almost entirely of nursing females, whose pups are doomed to starvation on the rookeries, it will be seen that the injury to the herd is very serious indeed.

Average catch per hunting day for each week of the spring season, 1893–1896.

[Based upon log entries of 39 schooners.]

	Weeks.																								
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.
1893 (11 vessels).																									
Hunting days	...	...	...	...	...	...	...	1	4	15	27	31	25	40	36	52	48	38	35	54	44	23	20	6	3
Catch	...	...	...	...	...	...	...	8	184	526	1,414	1,131	746	1,940	809	1,666	1,926	1,244	837	1,748	1,088	452	345	286	16
Average catch per hunting day	...	...	...	...	...	...	...	8	46	35	52	36	30	48	22	32	40	33	24	32	25	20	17	47	5
1894 (6 vessels).																									
Hunting days	1	3	2	2	1	4	6	14	16	21	19	12	19	17	10	18	19	21	26	25	10	2	...	...	...
Catch	29	50	16	74	27	35	16	409	560	869	561	346	751	460	112	462	422	331	485	635	155	20	...	...	...
Average catch per hunting day	29	17	8	37	27	9	3	29	35	41	30	29	40	27	11	26	22	16	19	25	16	10	...	...	...
1895 (13 vessels).																									
Hunting days	...	...	...	...	...	3	6	13	23	42	28	53	43	41	70	61	21	43	41	34	35	3	4	1	...
Catch	...	...	...	...	...	35	103	324	207	614	367	705	847	788	1,533	911	221	565	318	324	260	12	7	1	...
Average catch per hunting day	...	...	...	...	...	12	17	25	9	15	13	13	20	19	22	15	10	13	8	10	7	4	2	1	...
1896 (9 vessels).																									
Hunting days	...	...	...	...	3	...	1	21	32	39	37	26	24	38	36	41	34	23	31	27	19	5	6	3	...
Catch	...	...	...	...	49	...	10	95	333	491	546	356	247	374	548	667	605	242	445	257	73	33	14	3	...
Average catch per hunting day	...	...	...	...	16	...	10	5	10	13	15	14	10	10	15	16	18	11	14	9	4	7	2	1	...

Number of hunting days of 39 schooners during each week of the spring season, 1893–1896.

Name of vessel.	Jan. 24–31.	Feb. 1–7.	Feb. 8–14.	Feb. 15–21.	Feb. 22–28.	Mar. 1–7.	Mar. 8–14.	Mar. 15–21.	Mar. 22–28.	Mar. 29–Apr. 4.	Apr. 5–11.	Apr. 12–18.	Apr. 19–25.	Apr. 26–May 2.	May 3–9.	May 10–16.	May 17–23.	May 24–30.	May 31–June 6.	June 7–13.	June 14–20.	June 21–27.	June 28–July 4.	July 5–11.	July 12–19.	Total.	Average number of hunting days per vessel.
1896.																											
Golden Fleece							1	3	4	2	6	2	3	5	4	6	6	4	5	5	3						
Silver Fleece					3			2	3	4	1	2	2	4	4	3	2	2	3	3							
Elsie								2	5	4	6	3	3	4	5	5	4	1	4	1			1				
Alton										5	4	2	2	5	2	6	5	4	6	3	1						
M. M. Morrill								3	5	5	2	5	4	6	6	1	2	4	5	4	4						
W. Ainsworth								2	5	6	4	2	3	2	4	6	4	5	6	6	4		1	1			
Louisa D.										4	4	4	2	5	4	4	5	3				1	1	1			
Jane Gray								5	5	5	5	2	1	5	4	5	3		2	3	6	1		1			
Rattler								4	5	4	5	4	4	2	3	5	3			2	1	3	3				
Total					3		1	21	32	39	37	26	24	38	36	41	34	23	31	27	19	5	6	3	...	446	49.5
1895.																											
Penelope								2	2	2	2	4	3	4	5	4	2	4	2	2	2		1	1			
Kaio Maru						2		2	3	7	2	3	4	5	2	5	1	4	4								
Herman								2	1	3	2	5	3	6	7	6	3	3	2	5	5	1					
E. E. Webster								2	2	2	3	1	4	4	6	5	1	3	4	4	4						
Alton									2	3	3	4	3	1	6	3	2			2	2						
Bonanza										3	1	3	3	5	7	5	2	6	4	3	4						
Bowhead									2	4	3	6	5	3	6	3	1	5	4	1	3						
Winchester								1	2	4	2	4	2	2	5	6	1	2	4	5	5		1				
Sophia Sutherland							2	1	1	2	4	5	3	2	2	4	2										
Rattler											1	5	2	2	5	6		4	5	4	2						
Jane Gray									4	4	2	5	5	5	6	5	3	4	5	2	5	2					
Ida Etta									1	5	2	2	3	2	7	3	2	4	4	1							
Allie I. Alger						1	4	2	3	3	1	6	3		6	6	1	4	3	5	3		2				
Total						3	6	13	23	42	28	53	43	41	70	61	21	43	41	34	35	3	4	1	...	565	43.5
1894.																											
Chishima Maru I		1	1			2	2	2	3	3	4	1	5		4	4	6	3	6	4	1						
Chishima Maru III			1	1		1	2	1	2	1	2			2	3	6	3	4	5	4	1						
Louise Olsen							2	4		4	3	2	4	5		1	4	4	7	4							
Allie I. Alger									3	5	2	1	3	4	2	4	1	4	2	5	2						
Umbrina								4	5	4	4	5	4	6	1	3	4	4	3	5	6	2					
E. E. Webster	1	2		1	1	1		3	3	4	4	3	3				1	2	3	3							
Total	1	3	2	2	1	4	6	14	16	21	19	12	19	17	10	18	19	21	26	25	10	2	...	...	...	268	44.7
1893.																											
Beatrice								1	2	4	5	7	3	4	2	4	4	4	2	6	4	1		1	1		
Casco													1	6	6	7	4	4	3	4	4	1					
Arietis											3	1						1	4	5	4	4	3				
Carlotta G. Cox									1	3	5	7	4	4	5	7	5	4		6	7	4	3				
Geneva										2	3	4	3	4	4	4	5	2	1	5	3		4	1			
W. P. Hall											1	2	2	3	1	5	4	5	5	5	4	1	2				
Mermaid									1		1	1			1	7	5	4	4	4	3						
Agnes McDonald										1	5	6	2	5	4	5	5	3	4	6	5	4					
Vera										5	4	3	3	4	5	4	5	4	3	5	2	2	4	4	2		
Sadie Turpel													5	4	5	3	5	3	4	2	3	3	4				
Umbrina													2	6	3	6	6	4	5	6	5	3					
Total								1	4	15	27	31	25	40	36	52	48	38	35	54	44	23	20	6	3	502	45.6

Number of seals taken by 39 schooners during each week of the spring season, 1893–1896.

Name of vessel.	Jan. 24–31.	Feb. 1–7.	Feb. 8–14.	Feb. 15–21.	Feb. 22–28.	Mar. 1–7.	Mar. 8–14.	Mar. 15–21.	Mar. 22–28.	Mar. 29–Apr. 4.	Apr. 5–11.	Apr. 12–18.	Apr. 19–25.	Apr. 26–May 2.	May 3–9.	May 10–16.	May 17–23.	May 24–30.	May 31–June 6.	June 7–13.	June 14–20.	June 21–27.	June 28–July 4.	July 5–11.	July 12–19.
1896.																									
Golden Fleece							10	33	11	11	70	6	13	33	25	127	158	75	137	17	4				
Silver Fleece					49			5	24	43	4	6	21	70	76	36	28	8	23	11					
Elsie								5	64	36	123	72	48	34	120	34	76	1	54	1			2		
Alton										78	26	17	33	13	7	66	48	45	149	64	1				
M. M. Morrill								9	43	57	7	67	67	107	90	5	57	44	37	34	15				
W. Ainsworth								9	58	120	81	17	6	6	55	131	47	63	24	73	31		2	1	
Louisa D.										31	63	84	4	84	82	61	116	6				1	1	1	
Jane Gray								20	22	51	80	21	31	10	35	65	42		21	55	17	10		1	
Rattler								14	111	64	92	66	29	17	53	132	33			2	5	22	9		
Total					49		10	95	333	491	546	356	247	374	543	657	605	242	445	257	73	33	14	3	
1895.																									
Penelope								8	6	6	46	36	23	21	64	16	6	18	4	9	5		2	1	
Kaio Maru						24		79	22	115	115	21	82	64	8	39	10	19	35						
Herman								1	5	68	5	55	13	103	103	82	49	51	16	61	21	1			
E. E. Webster								115	15	21	54	3	45	94	100	81	13	63	43	81	38				
Alton									7	18	22	77	47	3	101	20	4			7	5				
Bonanza										23	5	69	29	138	305	174	20	84	28	14	37				
Bowhead									24	108	26	95	74	126	111	9	1	35	31	1	24				
Winchester								52	25	97	23	53	52	3	45	106	5	24	20	37	44		3		
Sophia Sutherland							4	54	12	27	13	29	35	19	60	37	2								
Rattler											22	53	62	27	82	59		40	40	15	7				
Jane Gray									47	64	15	63	192	119	304	113	49	58	18	22	36	11			
Ida Etta									2	23	20	26	42	71	118	58	50	71	64	9					
Allie I. Algar						11	99	15	42	44	1	125	151		132	117	12	102	19	78	43		2		
Total						35	103	324	207	614	367	705	847	788	1,533	911	221	565	318	324	260	12	7	1	
1894.																									
Chishima Maru I		3	1			5	5	29	52	49	64	6	59		18	40	38	28	66	34	4				
Chishima Maru III			15	13		5	3	25	6	2	2			5	17	65	22	46	41	10	1				
Louise Olsen							8	128		127	93	15	122	138		3	169	55	138	58					
Allie I. Alger									68	165	63	38	42	113	58	101	6	95	46	257	39				
Umbrina								113	284	350	204	170	215	204	19	244	170	45	103	212	111	20			
E. E. Webster	29	47		61	27	25		114	150	176	135	117	313				17	62	91	64					
Total	29	50	16	74	27	35	16	409	560	869	561	346	751	460	112	462	422	331	485	635	155	20			
1893.																									
Beatrice								8	55	136	198	114	74	195	22	166	130	70	14	125	45	21		1	1
Casco													17	200	254	242	115	246	66	137	99	20			
Arietis											204	149						76	152	183	82	53	7		
Carlotta G. Cox									74	156	365	205	150	278	109	199	211	160		217	123	119	48		
Geneva										107	215	94	45	213	140	108	165	65	32	241	69		49	40	
W. P. Hall											5	13	64	42	12	93	139	64	82	75	42	5	23		
Mermaid									55		53	31			4	176	106	136	193	124	48				
Agnes McDonald										41	259	464	48	187	47	168	408	76	163	203	191	83			
Vera										106	115	61	86	218	117	118	232	107	19	180	91	55	148	245	14
Sadie Turpel													168	136	71	84	180	72	23	59	40	71	70		1
Umbrina													94	471	33	312	240	172	93	204	178	25			
Total								8	184	526	1,414	1,131	746	1,940	809	1,666	1,926	1,244	837	1,748	1,008	452	345	286	16

THE CONTENTION OF THE PELAGIC SEALERS.

The conclusions we arrive at from the inspection of these diagrams may therefore be summed up as follows:

The seals are rapidly decreasing. The people, however, who are directly interested in the fitting and sending out of the pelagic sealers, and the latter themselves, are not yet willing to admit that. They do admit—for the figures are indisputable—that the catches have been decreasing, but they insist that there are just as many seals in the water as ever; that the sealers have seen as many in 1896 as in 1893 or 1894, and they refuse, consequently, to believe that the pelagic sealing is threatening the very existence of the seal herds. They refuse to accept the statements of the experts who have been examining the rookeries and who report an alarming diminution of the breeding seals, professing to believe them either bribed or misled by the companies who have leased the islands. They explain the undeniable decrease in the catches by alleging that the weather has been so bad in late years as to interfere with the sealing, and, on the Asiatic side, that the seals are now so wary and wild that the hunters can not get within range of them.

As to the first assertion, that the weather has interfered with the sealing, let us examine the tables. From the table given above (p. 270), the average number of days on which hunting was done by each schooner off the coast of Japan was as follows:

In 1893, average hunting days per schooner	45.6
In 1894, average hunting days per schooner	44.7
In 1895, average hunting days per schooner	43.5
In 1896, average hunting days per schooner	49.5

These figures alone disprove the allegation completely, as they show that in 1896, the year when the absolute and relative catches were smallest, the hunting days were much more numerous, or, in other words, the weather was greatly more favorable than in any previous year.

With regard to the other reason given for the decreasing catches, viz, the increasing wildness of the seals, it is sufficient to remark that the greatest drop in the average catch was in 1894, which fact in itself shows that the explanation given does not explain, for it is certain that if the decrease was due to the seals becoming shyer from the shooting the decrease would become greater for each succeeding year, and that consequently the greatest drop ought to be in 1896. It is quite likely that the seals have become more difficult of approach as a result of the shooting, but I maintain that the increased experience of the pelagic sealers in handling both vessel and gun has kept pace with and offset the effect of the noise of the shooting.

As for the contention of the sealers that they have of late years seen quite as many seals at one time as formerly, it may be remarked that it is probably true. It is quite reasonable to suppose that the bands of traveling seals are of approximately the same size, or rather that the seals in traveling keep about as close together as formerly, and that the sealer consequently sees as many as then *when he falls in with them.* But the places for *seeing* the decrease are the rookeries, and now that the representatives of the pelagic sealing interests themselves have become convinced of this fact, there is no excuse any more for the insinuations of a few of the more bigoted sealing captains.

That the more intelligent element among the sealers themselves are awakening to the fact that the seals are rapidly decreasing and that the pelagic sealing industry will soon be a thing of the past if really protective measures be not adopted speedily, is plain to any one who has conversed with them last year.

I venture to prophesy that the pelagic sealers themselves will next cry for protection to the seals. Many of them are now willing to submit to a closed season to include the months of August and September—the more since it would scarcely be any sacrifice at all in view of the small number of seals which can be secured in the feeding ground nowadays. In 1896 there were not a dozen schooners on the feeding grounds of the Commander Islands, and these were mostly on the feeding grounds of the Bering Islands seals, because those of Copper Island are nearly exhausted. A glance at plate 110, diagram *b*, shows how slight this sacrifice would be, especially if we remember that at the Commander Islands there is no close season at all, and that the hunting is allowed there all summer outside of the 30-mile limit.

THE FUTURE OF PELAGIC SEALING IN JAPANESE WATERS.

I have already pointed out the rapid and continued decrease of pelagic sealing on the Asiatic side. Anyone looking at the diagram showing the average catch per vessel during 1893–1896 (pl. 110, fig. *b*) may continue the downward lines and make a fairly accurate guess at the number of skins the schooners are likely to get in the future. There can thus be no doubt that the average number of skins per vessel will continue to decrease, subject to possible occasional fluctuations due to unusually favorable circumstances.

But that does not necessarily mean that the business will become less and less profitable in the same ratio. There may be two ways to prevent that. In the first place, if the price of the skins were to advance correspondingly as the number of pelagic skins on the market decreases, there might still be profit in pelagic sealing. Unfortunately for the business, the prospect for advancing prices are very slim. As a matter of fact, the prices have gone down at about the same ratio as the supply of pelagic skins. The reason is not far to seek. The value of the fully dressed seal fur is mainly due to the artificial coloring and the labor spent in dressing the skin. it is consequently to a great extent an industrial and artificial product. The same skill and labor spent on other and cheaper furs result in furs very similar and nearly as attractive. The seal fur owes its fashionable position and high value chiefly to the persistent efforts of the Alaska Commercial Company to introduce it and their ability to manipulate the market to the best advantage.

Should the United States and Russian Governments, moreover, undertake to brand all the female seals, it would undoubtedly depress the price of pelagic skins still further. No matter how much or how little the branding might damage the skins, the very fact that three out of every four pelagic skins would be more or less injured would still further prejudice the market against them and reduce their price.

The other way of preventing the decrease in profits as the number of skins decreases would be the reduction of expenses in taking them. I have already alluded to the attempt at doing so in the present chapter under the heading "Three classes of pelagic sealers in Japanese waters" (p. 262), as I showed that the Japanese are gradually driving the more expensive Canadian and American craft out of the business in Asiatic waters. Let us examine some figures relating to the schooners owned by the Japanese:

1894.

Name of schooner.	Skins.
Unohi Maru	176
Third Chishima Maru	279
First Chishima Maru	510
Total	965

1895.

Name of schooner.	Skins.	Name of schooner.	Skins.
Kaio Maru	633	First Chishima Maru	572
Unohi Maru	502	Third Chishima Maru	805
Yakumo Maru	74		
Kaiyen Maru	222	Total	2,808

1896.

Name of vessel.	Skins.	Name of vessel.	Skins.
Kaio Maru	651	Kaiyen Maru	553
Yakumo Maru	46	Tenyu Maru	52
Unohi Maru	378	Kamaishi Maru	58
First Chishima Maru	411	Hoju Maru	84
Third Chishima Maru	774		
		Total	3,007

Pelagic catch of Japanese sealing vessels in Asiatic waters, season 1897.

Vessels.	Tons.	Home port.	Master.	Owner.	Catch.		
					Off Japan.	Vicinity Copper Island.	Total.
First Chishima Maru	68	Hakodate		Suisan Kaisha	442	256	698
Third Chishima Maru	68	do	Evans	do	636	158	794
Kaio Maru	87	do	Tanaka	do	507	166	673
Unohi Maru	63	do		K. Tsuji	397		397
Yakumo Maru	44	do		do	231	155	386
Ishikawa Maru	170	do	Hansen	N. Gunshi	404		404
Seitoku Maru	34	do		K. Johigaki	74		74
Tenyu Maru	40	Kamaishi	Bruce	K. Komatsu	321		321
Kamaishi Maru		do			112		112
Toyotsu Maru	72	Tateyama		R. Sekizawa	6		6
Aiyo Maru	65	Shinagawa		D. Yoshida	152		152
Tokiwa Maru	15	Tokyo		K. Awoki	183		183
Yachiyo Maru		do	Williams	do	492	55	547
Kaiyen Maru	72	do		do	457	43	500
Total					4,414	833	5,247

Pelagic catch of foreign sealing vessels domiciled in Japan, sealing in Asiatic waters, season 1897.

Vessel.	Tons.	Home port.	Flag.	Master.	Catch.					
					Off Japan.			Off Russian coast.		
					Males.	Females.	Total.	Males.	Females.	Total.
Golden Fleece	127	Yokohama	American	E. W. Funcke	334	302	636	62	222	284
Silver Fleece		do	do	T. R. Thompson			533			142
Pointer[a]		do	British	—— Bardsley			286			224
Total							1,455			650
Total										2,105

[a] Lost at Skotan. Of the 224 skins on board at the time of the wreck only 201 were saved.

There were consequently pelagic sealers owned by Japanese operating in 1893, none; in 1894, 3; in 1895, 6; in 1896, 9; in 1897, 14.

The home ports of the schooners of 1897 are as follows: Hakodate, 7 schooners; Kamaishi, 2 schooners; Tateyama, 1 schooner; Shinagawa, 1 schooner; Tokyo, 3 schooners; total, 14.

In order to illustrate the activity of these it may be said that one of the new Tokyo schooners started out as early as January 18 and arrived on February 6 in Ogonohama with 124 skins.

To show how cheaply the Japanese can transact their business, let me add the information contained in a letter from Japan dated February 12, 1897, that the Japanese skins for 1896 averaged, after deducting shipping and other expenses in London, about 15.50 yen; the average cost up to the time of arrival in Hakodate per skin was about 7.50 yen, leaving a net profit of 8 yen per skin. "As I stated to you last year, it is my belief that in a year or two the whole pelagic sealing business will be in the hands of the Japanese, as they can make a big profit where foreign schooners will starve."

To prove by figures how surely the foreigners are being driven out let me present the following table:

Number of pelagic sealing vessels in Japanese waters.

Year.	Canadian.	United States.	Foreign vessels domiciled in Japan.	Total foreign.	Japanese.
1893	22	22	(?) 7	51	0
1894	36	39	7	82	3
1895	22	14	5	41	6
1896	28	8	3	39	9
1897	11	2	3	16	14

EXTRACTS OF SEALING LOGS.

Extract of sealing log of the American schooner Golden Fleece, E. W. Funcke, master, for the spring season of 1897.

[From the Official Sealing Log.]

Date.	Latitude.	Longitude.	Seals.				
			Seen.	Shot at.	Taken.		
					Males.	Females.	Total.
1897.	° ′	° ′					
Mar. 8	Left Yokohama.						
12	38 56 N.	141 17 E.	140	15	1	7	8
13	35 49 N.	141 11 E.	3	....	....	....	....
14	35 56 N.	141 00 E.	13	....	....	....	....
15	35 00 N.	141 20 E.	12	....	....	....	....
16	36 35 N.	141 08 E.	30	3	....	2	2
17	36 32 N.	141 20 E.	45	7	2	2	4
18	36 34 N.	141 25 E.	65	20	3	11	14
20	36 20 N.	140 56 E.	7	....	....	....	....
21	36 15 N.	140 52 E.	11	3	....	2	2
22	36 03 N.	141 15 E.	150	30	3	18	21
25	35 59 N.	141 30 E.	9	....	....	....	....
26	36 08 N.	141 02 E.	20	15	2	7	9
29	Anchored at Yokohama.						
31	Left Yokohama.						
Apr. 5	37 20 N.	141 30 E.	....	25	5	12	17
6	37 18 N.	141 36 E.	....	35	11	14	25
8	37 40 N.	141 43 E.	....	12	3	6	9
12	Anchored at Oginohama.						
13	Left Oginohama.						
17	38 06 N.	142 17 E.	....	16	3	5	8
18	38 16 N.	142 27 E.	60	13	4	6	10
19	38 15 N.	142 31 E.	70	25	6	12	18
20	38 37 N.	142 23 E.	90	40	7	18	25
24	38 45 N.	141 52 E.	6	5	2	3	5
25	38 40 N.	140 45 E.	38	6	3	1	4
26	38 20 N.	141 10 E.	60	45	13	20	33
27	38 30 N.	141 20 E.	200	50	23	14	37
28	38 37 N.	141 27 E.	....	4	2	2	4
29	38 35 N.	141 15 E.	30	22	13	4	17
May 1	39 20 N.	142 38 E.	6	2	2	....	2
2	38 43 N.	143 05 E.	....	20	4	10	14
3	38 57 N.	142 06 E.	60	40	16	13	29
5	33 50 N.	142 03 E.	1	1	1	....	1
6	39 22 N.	142 15 E.	30	26	16	5	21
7	39 27 N.	142 18 E.	....	4	3	1	4
9	38 33 N.	142 12 E.	130	70	41	14	55
10	38 31 N.	142 13 E.	....	15	10	2	12
12	40 33 N.	142 25 E.	30	25	11	7	18
13	40 28 N.	142 20 E.	....	25	8	9	17
14	40 53 N.	142 15 E.	....	30	12	9	21
15	41 17 N	142 01 E.	....	8	4	2	6
16	41 19	142 12 E.	....	5	0	4	4
18	42 28	144 03 E.	....	1	1	0	1
19	42 45 N	144 35 E.	....	5	3	1	4
20	42 41 N.	144 40 E.	....	0	0	0	0
21	42 08 N.	144 45 E.	....	1	1	0	1
22	41 43 N.	143 00 E.	....	10	5	2	7
23	42 03 N.	142 12 E.	20	9	5	2	7
24	42 08 N.	142 09 E.	....	15	7	4	11
25	41 57 N.	141 56 E.	....	1	1	0	1
26	42 10 N.	141 53 E.	....	11	7	1	8
27	42 09 N.	141 49 E.	....	25	11	6	17
20	42 13 N.	141 47 E.	50	35	20	8	28
June 1	42 04 N.	141 40 E.	0	0	0	0	0
3	41 35 N.	143 30 E.	....	7	3	2	5
4	42 12 N.	144 03 E.	....	20	6	8	14
5	42 15 N.	144 14 E.	....	9	4	3	7
8	42 45 N.	145 28 E.	....	2	2	0	2
9	42 37 N.	145 28 E.	....	1	0	0	0
10	43 11 N.	146 12 E.	....	2	2	0	2
11	43 20 N.	147 30 E.	....	2	0	2	2
12	43 32 N.	147 45 E.	....	5	2	2	4
13	44 32 N.	147 30 E.	....	1	0	1	1
14	44 32 N.	147 32 E.	....	1	1	0	1
18	43 57 N.	147 20 E.	....	1	1	0	1
19	44 08 N.	147 30 E.	....	7	4	2	6
21	44 50 N.	148 00 E.	....	1	1	0	1
23	45 03 N.	148 32 E.	....	1	0	1	1

Extract of sealing log of the American schooner Golden Fleece, E. W. Funcke, master, for the spring season of 1897—Continued.

[From the Official Sealing Log.]

Date.	Latitude.	Longitude.	Seals.				
			Seen.	Shot at.	Taken.		
					Males.	Females.	Total.
1897.	° ′	° ′					
June 25	43 34 N.	146 53 E.	....	1	1	0	1
26	42 57 N.	146 05 E.	....	8	5	2	7
27	42 41 N.	145 20 E.	....	18	7	8	15
28	41 20 N.	145 10 E.	....	3	0	3	3
29	41 57 N.	144 18 E.	....	1	0	1	1
July 1	Anchor Hokadate.	Landed skins.		....	....	....	....
7	Left Hokadate.			....	....	....	....
9	41 47 N.	143 46 E.	....	....	0	1	1
Total	....	....	....	866	334	302	636

Extract of sealing log of the American schooner Elsie, F. W. Currie, master, for the spring season of 1897 (57 tons).

[From the Official Sealing Log.]

Date.	Latitude.	Longitude.	Number of seals.		
			Male.	Female.	Total.
1897.	° ′	° ′			
Apr. 1	35 43 N.	146 34 E.	....	2	2
5	37 46 N.	143 54 E.	4	63	67
6	37 59 N.	143 47 E.	1	6	7
7	38 05 N.	143 40 E.	....	1	1
8	37 42 N.	143 07 E.	....	9	9
13	38 30 N.	141 59 E.	3	8	11
15	38 20 N.	142 20 E.	....	1	1
17	37 42 N.	142 34 E.	5	11	16
18	38 06 N.	143 22 E.	....	1	1
19	37 36 N.	143 40 E.	2	4	6
20	37 45 N.	142 53 E.	2	12	14
21	37 26 N.	142 54 E.	....	13	13
25	38 19 N.	145 31 E.	....	2	2
27	37 37 N.	147 30 E.	1	....	1
30	37 47 N.	144 09 E.	3	....	4
May 1	37 32 N.	143 55 E.	7	44	51
2	37 15 N.	143 45 E.	17	82	99
3	37 34 N.	144 00 E.	....	1	1
5	37 28 N.	143 29 E.	....	1	1
6	37 33 N.	143 48 E.	7	18	25
7	37 14 N.	143 22 E.	3	13	16
9	37 37 N.	144 01 E.	5	12	17
10	37 46 N.	143 50 E.	....	2	2
11	37 42 N.	143 58 E.	53	18	71
12	37 28 N.	142 33 E.	35	13	48
13	37 11 N.	142 25 E.	3	57	60
14	37 41 N.	142 30 E.	2	6	8
17	39 03 N.	146 36 E.	....	1	1
19	39 24 N.	147 48 E.	....	2	2
21	39 40 N.	147 45 E.	1	1	2
23	38 05 N.	145 48 E.	....	7	7
24	39 17 N.	145 00 E.	1	1	2
25	40 44 N.	144 13 E.	7	4	11
27	41 18 N.	143 35 E.	....	1	1
28	41 30 N.	143 35 E.	3	1	4
29	42 19 N.	143 53 E.	1	....	1
June 2	44 10 N.	147 18 E.	1	....	1
3*a*	44 18 N.	147 20 E.	....	4	4
4*a*	44 16 N.	147 24 E.	2	4	6
5	44 09 N.	147 22 E.	3	3	6
8	44 14 N.	147 13 E.	1	....	1
9	44 10 N.	147 32 E.	1	1	2
10	44 17 N.	147 28 E.	1	3	4
11	No position.	....	1	....	1
25	50 47 N.	158 15 E.	1	2	3
Total	....	....	177	435	612

a Boats reporting large number of seals traveling to the northeast.

Extract of sealing log of the American schooner St. Lawrence, S. Colder, master, for the spring season of 1897 (39 tons).

[From the Official Sealing Log.]

Date.	Latitude.		Longitude.		Number of seals.		
	°	′	°	′	Male.	Female.	Total.
1897.							
Mar. 16	38	10 N.	141	51 E.	......	9	9
18	38	37 N.	142	26 E.	1	......	1
19	39	03 N.	142	42 E.	......	1	1
22	36	16 N.	141	46 E.	4	26	30
30	37	20 N.	142	25 E.	1	3	4
Apr. 2	37	28 N.	142	52 E.	8	41	49
5	37	14 N.	142	42 E.	......	1	1
6	37	31 N.	140	03 E.	14	82	96
7	37	35 N.	142	18 E.	......	2	2
8	37	48 N.	142	18 E.	......	1	1
9	37	05 N.	142	25 E.	8	17	25
11	37	46 N.	142	18 E.	......	1	1
12	37	26 N.	141	30 E.	......	4	4
13	37	55 N.	141	47 E.	9	13	22
15	38	41 N.	142	39 E.	1	......	1
17	37	52 N.	144	46 E.	2	15	17
19	38	20 N.	141	33 E.	......	1	1
20	38	09 N.	142	12 E.	11	21	32
21	38	30 N.	142	03 E.	......	1	1
25	38	30 N.	142	20 E.	1	......	1
26	38	04 N.	142	20 E.	......	10	10
27	37	45 N.	141	54 E.	2	20	22
28	37	20 N.	142	02 E.	1	3	4
29	38	25 N.	143	57 E.	8	26	34
30	38	07 N.	143	43 E.	2	......	2
May 1	37	56 N.	143	59 E.	1	4	5
2	37	43 N.	143	27 E.	12	39	51
3	37	46 N.	143	30 E.	3	30	33
10	41	17 N.	142	29 E.	......	5	5
11	41	43 N.	142	13 E.	1	10	11
12	41	50 N.	142	11 E.	......	8	8
13	41	52 N.	142	13 E.	4	8	12
14 *a*	......		......		1	2	3
16 *b*	......		......		2	6	8
23 *a*	......		......		3	2	5
24 *a*	......		......		8	7	15
26 *a*	......		......		5	6	11
29 *a*	......		......		5	2	7
June 2	42	46 N.	146	57 E.	1	......	1
4	43	26 N.	146	54 E.	5	13	18
5	43	27 N.	147	43 E.	1	9	10
6	43	22 N.	147	42 E.	1	1	2
9	43	10 N.	146	00 E.	4	......	4
10	43	20 N.	146	16 E.	7	1	8
21	46	32 N.	146	44 E.	......	1	1
25	50	20 N.	156	05 E.	......	4	4
30	50	35 N.	156	12 E.	1	......	1
July 1	50	05 N.	156	02 E.	4	47	51
3	50	02 N.	146	06 E.	......	3	3
4	49	55 N.	146	15 E.	2	1	3
5	50	07 N.	146	02 E.	......	9	9
9	49	07 N.	155	31 E.	......	1	1
Total	......		......		144	517	661

a Straits of Tsugaru. *b* Hakodate.

Extract of sealing log of the Japanese schooner Kaiyen Maru, of Tokyo, for the spring season of 1897.

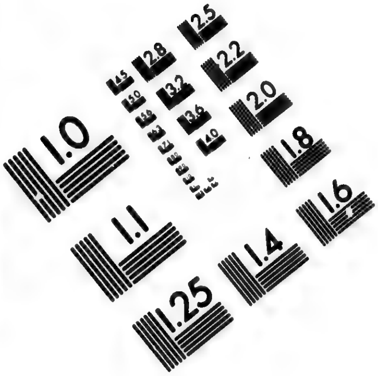
[From official report to Imperial fisheries bureau, Tokyo, Japan.]

Date.	Position.	Number of seals.	Date.	Position.	Number of seals.
1897.			1897.		
Feb. 24	Off Kinkasan	13	May 12	Off Mororan	5
25	do	5	13	do	22
28	do	13	14	do	9
Mar. 3	do	21	15	do	18
4	do	1	16	do	13
7	do	3	17	do	2
14	do	4	18	do	11
19	do	2	19	do	18
20	do	2	June 3	do	14
21	do	6	4	Off Skotan	4
22	do	3	5	do	2
26	do	3	7	do	3
29	do	27	8	do	2
30	do	4	9	do	3
Apr. 1	do	3	10	do	8
12	do	14	13	do	6
13	do	15	14	do	1
17	do	4	16	do	1
19	do	5	19	do	8
20	do	13	23	do	6
21	do	1	July 14	do	5
24	do	4	15	Off Iturup	10
26	do	18	21	do	1
27	do	21	25	do	2
28	do	1	27	do	1
29	do	5	28	do	8
May 2	Off Mororan	4	29	do	6
6	do	15	30	do	2
9	do	18	31	do	2
10	do	12			
11	do	4	Total		457

Extract of sealing log of the Japanese schooner Yachiyo Maru, of Tokyo, for the spring season of 1897.

[From the official report to Imperial fisheries bureau, Tokyo, Japan.]

Date.	Position.	Number of seals.	Date.	Position.	Number of seals.
1897.			1897.		
Mar. 15	Off Inuboye	1	May 18	Off Yamada	7
17	do	1	19	do	3
18	do	3	20	do	2
19	do	2	23	do	3
21	do	15	24	do	2
22	do	3	28	do	1
25	do	1	30	do	4
26	do	9	June 4	do	3
Apr. 5	Off Kinkasan	48	7	do	3
6	do	44	12	do	1
8	do	1	13	do	2
10	do	2	14	do	6
13	do	27	25	Off Mororan	15
18	do	3	28	do	17
19	do	6	29	do	2
20	do	9	30	do	1
23	do	1	July 1	do	4
24	do	2	3	do	13
26	do	36	6	do	2
27	do	7	7	do	3
28	do	1	10	Off Yerimo	3
29	do	10	12	do	1
30	do	1	17	do	4
May 1	do	2	18	do	2
2	do	4	19	do	3
3	do	3	22	do	16
4	Off Yamada	4	27	do	12
6	do	22	29	do	14
7	do	22	30	do	3
9	do	21			
10	do	29	Total		492



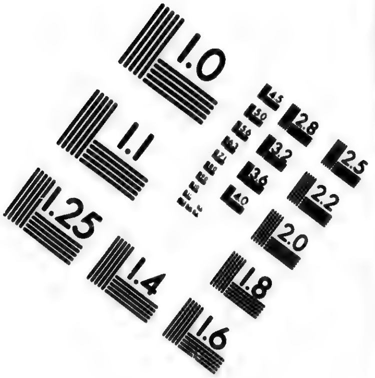
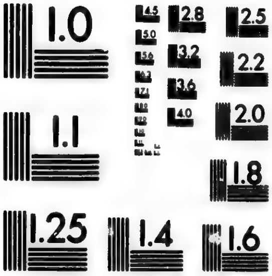
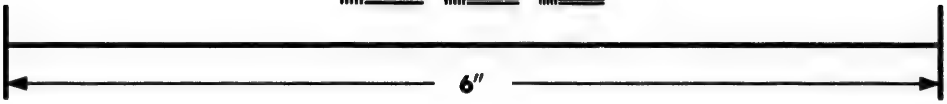
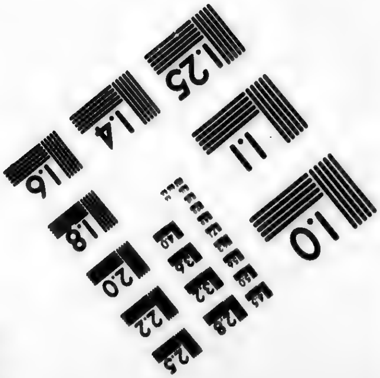


IMAGE EVALUATION
TEST TARGET (MT-3)







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Extract of sealing log of the Japanese schooner Tokiwa Maru, of Tokyo, for the spring season of 1897.

[From the official report to Imperia fisheries bureau, Tokyo, Japan.]

Date.	Position.	Number of seals.	Date.	Position.	Number of seals.
1897.			1897.		
Feb. 5[a]	Off Kinkasan	1	Mar. 23	Off Kinkasan	1
18	do	1	26	do	17
23	do	17	29	do	5
26	do	1	Apr. 1	do	15
Mar. 3	do	1	6	do	69
4	do	1	13	do	10
13	do	7	21	do	12
14	do	4	23	do	11
15	do	9			
22	do	1	Total		183

[a] Started January 19.

Extract of sealing log of the Japanese schooner Toyotsu Maru, of Tateyama, for the spring season of 1897.

[From the official report to the Imperial fisheries bureau, Tokyo.]

NOTE.—Sailing from Tateyama on April 26, seals were sighted off Miako on May 2. During fifteen days she was engaged in hunting. Anchored at Mororan May 21; sailed again on May 26; sighted seals 8 miles off Yesan, but they were rare Returned to Tateyama June 2. The seals taken were speared.

Date.	Latitude.	Longitude.	Seals taken.		
			Male.	Female.	Total.
1897.	° ′	° ′			
May 3	39 33 N.	143 04 E.	1		1
6	40 57 N.	142 17 E.		1	1
12	41 53 N.	142 28 E.	1		1
15	41 42 N.	143 10 E.		1	1
18	40 47 N.	141 48 E.		1	1
19	41 28 N.	141 59 E.	1		1
Total			3	3	6

Extract of sealing log of the American schooner Golden Fleece (a), E. W. Funcke, master, for the spring season of 1896.

[From the Official Sealing Log.]

Date.	Latitude.	Longitude.	Seals.				
			Seen.	Shot at.	Taken.		
					Males.	Females.	Total.
1896.	° ′	° ′					
Mar. 14	37 07 N.	141 40 E.		16	1	9	10
15	37 23 N.	141 50 E.		23	4	12	16
16	37 38 N.	141 40 E.		2		1	1
18	38 02 N.	142 12 E.		21	5	11	16
23	39 11 N.	142 16 E.		6	2	3	5
24	39 10 N.	142 23 E.		4		3	3
25	38 43 N.	142 48 E.		2			
26	38 18 N.	142 20 E.		4	1	2	3
30	38 06 N.	141 58 E.		12	2	6	8
31	38 10 N.	141 30 E.		1			
Apr. 4	38 16 N.	142 12 E.		5	1	2	3
5	39 13 N.			16	5	8	13
6	39 03 N.	142 51 E.		12	7	5	12
7	39 06 N.	142 40 E.		1		1	1
8	39 08 N.	142 25 E.		2	1	1	2
9	39 11 N.	142 40 E.	200	40	8	19	27
10	38 36 N.	142 26 E.		17	6	9	15
11	39 15 N.	142 28 E.		1			
13	39 03 N.	142 57 E.	7	4		2	2

[a] 121 tons, 19 sailors, 5 white hunters, 8 boats, 17 guns

Extract of sealing log of the American schooner Golden Fleece, E. W. Funcke, master, for the spring season of 1896—**Continued.**

[From the Official Sealing Log.]

Date.	Latitude.	Longitude.	Seals.				
			Seen.	Shot at.	Taken.		
					Males.	Females.	Total.
1896.	° ′	° ′					
Apr. 16	30 08 N.	143 06 E.	1	1	....	....	....
17	39 18 N.	142 27 E.	....	5	1	3	4
19	40 10 N.	143 50 E.	3	3	1	1	2
22	40 14 N.	142 23 E.	2	2	....	1	1
23	30 16 N.	142 27 E.	1	....	....	....	....
24	38 47 N.	142 16 E.	20	15	3	7	10
26	38 11 N.	142 07 E.	60	20	3	8	11
29	37 38 N.	142 56 E.	18	12	1	8	9
30	37 40 N.	142 38 E.	2	1	....	1	1
May 1	38 36 N.	141 56 E.	....	1	1	....	1
2	38 32 N.	142 23 E.	20	13	1	10	11
3	38 33 N.	142 20 E.	7	6	....	5	5
7	40 37 N.	145 29 E.	14	4	3	1	4
8	40 29 N.	145 32 E.	30	18	3	12	15
9	41 12 N.	145 18 E.	3	1	....	1	1
10	41 37 N.	142 36 E.	13	1	....	....	....
11	42 04 N.	142 30 E.	....	28	19	3	22
12	41 53 N.	142 36 E.	9	3	2	1	3
13	39 55 N.	141 *a* 42 E.	....	1	....	1	1
14	41 53 N.	142 45 E.	35	16	6	7	13
15	41 57 N.	142 40 E.	250	70	*b* 56	7	63
16	41 49 N.	142 42 E.	70	35	14	11	25
17	41 54 N.	142 40 E.	5	1	1	....	1
18	41 54 N.	142 43 E.	500	90	54	21	75
19	41 56 N.	142 40 E.	250	65	41	11	52
20	41 55 N.	142 43 E.	30	8	5	1	6
21	42 07 N.	142 28 E.	....	30	19	4	23
22	42 03 N.	142 20 E.	....	1	....	....	....
23	42 00 N.	142 50 E.	(*c*)	1	....	....	1
24	42 07 N.	142 00 E.	50	40	23	4	27
25	42 03 N.	141 55 E.	30	16	11	2	13
28	41 57 N.	142 38 E.	11	6	4	2	6
29	41 55 N.	142 39 E.	35	30	21	7	28
30	41 53 N.	142 37 E.	3	....	....	....	....
31	42 00 N.	142 41 E.	30	11	7	3	10
June 2	41 42 N.	141 50 E.	8	4	2	1	3
3	42 12 N.	141 45 E.	75	45	29	8	37
5	42 13 N.	141 44 E.	200	65	39	16	55
6	42 12 N.	141 40 E.	45	40	27	5	32
7	42 12 N.	141 40 E.	40	27	12	8	20
9	42 15 N.	141 40 E.	12	7	4	1	5
10	42 12 N.	141 35 E.	30	15	7	5	12
11	42 09 N.	141 39 E.	4	4	2	2	4
13	41 44 N.	143 12 E.	2	3	....	1	1
14	42 21 N.	144 07 E.	1	....	....	....	....
15	42 37 N.	144 32 E.	20	16	11	3	14
16	42 34 N.	144 41 E.	3	1	1	....	1
17	42 40 N.	144 57 E.	7	4	3	1	4
18	42 42 N.	145 15 E.	1	....	....	....	....
July 4	41 48 N.	142 14 E.	1	....	....	....	....
5	41 30 N.	143 17 E.	4	3	2	....	2
6	41 38 N.	144 50 E.	4	2	1	....	1
7	42 09 N.	146 07 E.	12	10	8	1	9
11	44 23 N.	148 12 E.	....	2	2	....	2
12	45 02 N.	149 30 E.	....	2	1	1	2
20	50 48 N.	159 30 E.	....	1	1	....	1
Total	....	....	....	994	496	290	786

a Position? L. S. *b* Principally 2-year-old males. *c* Several.

Extract of sealing log of the American schooner Silver Fleece, W. Thompson, master, for the spring season of 1896.

[From an abstract of the log by H. C. Fassett.]

Date.	Latitude.	Longitude.	Seals.	Remarks.
1896.	° ′	° ′		
Feb. 23	36 55 N.	141 45 E.	....	Left Yokohama Feb. 15.
24	37 07 N.	141 55 E.	24	
27	36 53 N.	141 41 E.	3	
28	36 59 N.	141 35 E.	22	
Mar. 18	37 59 N.	142 18 E.	4	
21	37 40 N.	141 35 E.	1	
22	37 33 N.	141 35 E.	4	
23	38 00 N.	142 21 E.	10	
24	38 09 N.	142 30 E.	10	
30	38 10 N.	142 20 E.	2	
Apr. 1	39 15 N.	143 14 E.	24	
2	39 13 N.	143 01 E.	4	
4	39 29 N.	142 58 E.	13	
9	39 32 N.	143 10 E.	4	
13	38 47 N.	142 00 E.	5	
16	37 31 N.	142 46 E.	1	
23	39 37 N.	146 10 E.	4	
24	39 09 N.	145 30 E.	17	
26	39 15 N.	147 04 E.	15	
28	39 12 N.	146 47 E.	25	
29	39 25 N.	147 01 E.	23	
May 2	39 15 N.	146 50 E.	7	
3	39 45 N.	147 02 E.	16	
7	39 54 N.	147 15 E.	12	
8	39 50 N.	146 40 E.	43	
9	39 40 N.	146 52 E.	5	
11	....	....	3	No position.
15	41 58 N.	142 50 E.	25	
16	41 57 N.	142 34 E.	8	
18	42 00 N.	142 00 E.	24	
19	42 10 N.	141 45 E.	4	Arrived Hakodate May 20.
27	41 54 N.	142 30 E.	....	
28	42 00 N.	142 45 E.	1	
29	42 04 N.	142 50 E.	7	
31	....	....	1	C. Yerimo E. 25 miles.
June 3	....	....	7	C. Yerimo W. 2 miles.
4	41 50 N.	143 55 E.	2	
5	....	....	13	C. Yerimo W. by S. 20 miles.
7	42 37 N.	144 35 E.	1	Stood toward Skotan.
11	....	....	4	Skotan NW. by W.; Stake Pt., Iturup, NNW.
12	....	....	6	
16	47 30 N.	....	....	Saw 2 pup seals from vessel.
Total	....	....	404	

Extract of the sealing log of the American schooner Elsie, F. Currie, master, sealing off the coast of Japan, for the spring season of 1896.

Date.		Males.	Females.	Sex not determined.	Total.	Latitude.	Longitude.
1896.						° ′	° ′
Mar.	18	....	1	....	1	37 13 N.	142 49 E.
	19	1	3	....	4	37 00 N.	143 44 E.
	23	9	17	....	26	37 10 N.	144 49 E.
	24	7	8	....	15	37 30 N.	144 40 E.
	25	4	2	....	6	37 09 N.	144 33 E.
	26	7	4	....	11	36 50 N.	144 30 E.
	27	4	2	....	6	36 56 N.	144 47 E.
	30	9	8	....	17	37 09 N.	145 07 E.
	31	3	1	....	4	37 12 N.	145 10 E.
Apr.	1	9	5	....	14	37 20 N.	144 50 E.
	2	1	....	....	1	37 24 N.	146 20 E.
	3	3	2	....	5	37 39 N.	146 49 E.
	4	....	1	....	1	36 20 N.	147 12 E.
	6	20	30	....	50	37 31 N.	145 09 E.
	7	4	11	....	15	37 29 N.	145 11 E.
	9	20	16	....	36	37 41 N.	145 29 E.
	10	5	11	....	16	37 42 N.	144 57 E.
	12	4	5	9	18	37 20 N.	145 07 E.
	13	3	11	28	42	37 30 N.	145 26 E.
	15	9	3	....	12	37 30 N.	145 30 E.
	19	3	4	....	7	37 32 N.	145 29 E.
	20	2	....	....	2	37 53 N.	145 40 E.
	22	5	29	....	34	37 28 N.	145 36 E.
	27	....	1	....	1	38 16 N.	146 02 E.
	28	6	2	....	8	38 00 N.	145 54 E.
	29	1	....	....	1	37 53 N.	145 52 E.
May	2	9	15	....	24	38 33 N.	146 10 E.
	3	4	11	....	15	38 43 N.	146 33 E.
	5	1	....	....	1	38 56 N.	145 46 E.
	7	35	7	....	42	38 50 N.	145 00 E.
	8	28	6	....	34	38 50 N.	145 03 E.
	9	11	17	....	28	39 12 N.	145 18 E.
	11	5	1	....	6	39 20 N.	144 59 E.
	13	....	1	....	1	39 50 N.	143 38 E.
	14	5	10	....	15	39 07 N.	144 42 E.
	15	....	1	....	1	39 17 N.	144 57 E.
	16	4	7	....	11	39 12 N.	145 50 E.
	17	19	7	....	26	39 08 N.	146 18 E.
	18	14	7	....	21	39 06 N.	146 26 E.
	19	1	2	....	3	39 00 N.	146 30 E.
	21	22	4	....	26	40 01 N.	144 55 E.
	29	....	1	....	1	39 38 N.	147 20 E.
June	2	8	....	....	8	41 36 N.	144 05 E.
	3	28	1	....	29	41 23 N.	144 30 E.
	4	4	....	....	4	41 24 N.	144 24 E.
	5	13	....	....	13	Cape Yerimo, WNW., distant 18 miles.	
	7	1	....	....	1	Cape Yerimo, WNW., distant 30 miles.	
	28	2	....	....	2	42 54 N.	149 40 E.
Total		353	275	37	665		

Extract of the sealing log of the American schooner Alton, sealing off the coast of Japan, for the spring season of 1896.

Date.	Males.	Females.	Total.	Latitude.	Longitude.
1896.				° ′	° ′
Mar. 30	1		1	38 17 N.	141 41 E.
Apr. 1	2	19	21	38 48 N.	142 31 E.
2	2	5	7	38 31 N.	143 10 E.
3	3	8	11	39 07 N.	143 01 E.
4	10	28	38	39 14 N.	142 16 E.
5	8	6	14	39 01 N.	142 44 E.
6	2		2	38 57 N.	142 16 E.
8		2	2	39 35 N.	142 26 E.
9	5	3	8	39 29 N.	142 35 E.
12	4	2	6	39 42 N.	143 46 E.
13	6	5	11	39 22 N.	143 26 E.
22	3	2	5	41 48 N.	141 28 E.
23	14	14	28	42 05 N.	141 40 E.
26	2	1	3	41 50 N.	141 51 E.
27	1		1	42 13 N.	141 53 E.
28	3	1	4	41 19 N.	142 04 E.
May 1	2	2	4	40 36 N.	143 45 E.
2		1	1	40 00 N.	144 22 E.
8		1	1	40 00 N.	143 00 E.
9	2	4	6	40 51 N.	142 23 E.
11		5	5	41 54 N.	141 55 E.
12	1		1	41 31 N.	142 44 E.
13	3	5	8	41 25 N.	143 08 E.
14	4	3	7	41 30 N.	143 00 E.
15	8	4	12	41 30 N.	143 05 E.
16	20	13	33	41 40 N.	143 12 E.
17	6	3	9	41 42 N.	143 10 E.
18	8	4	12	41 42 N.	142 42 E.
19	7	7	14	41 43 N.	142 42 E.
21	11		11	41 51 N.	141 48 E.
22	2		2	42 12 N.	141 50 E.
24	10	14	24	42 11 N.	141 30 E.
25	7	7	14	42 15 N.	141 20 E.
29	1		1	42 40 N.	145 05 E.
30	4	2	6	42 37 N.	145 10 E.
June 1	4	3	7	42 42 N.	144 52 E.
2	5	2	7	42 42 N.	144 05 E.
3	21	7	28	42 29 N.	144 00 E.
4	30	4	34	42 40 N.	144 10 E.
5	42	7	49	42 37 N.	144 00 E.
6	19	5	24	42 29 N.	144 10 E.
7	15	10	25	42 20 N.	144 07 E.
11	15	10	25	43 00 N.	145 48 E.
12	3	11	14	43 05 N.	145 45 E.
14		1	1	43 50 N.	147 00 E.
Total	315	231	546		

Extract of the sealing log of the American schooner M. M. Morrill, sealing off the coast of Japan, for the spring season of 1896.

Date.		Males.	Females.	Total.	Latitude.	Longitude.
1896.					° ′	° ′
Mar.	18	1	3	4	38 34 N.	143 12 E.
	19		1	1	38 30 N.	143 20 E.
	21	2	2	4	38 00 N.	143 00 E.
	22		4	4	38 20 N.	143 15 E.
	23	8	8	16	38 10 N.	143 05 E.
	24	3	2	5	38 00 N.	143 00 E.
	25	4	7	11	38 02 N.	143 06 E.
	26	4	3	7	38 17 N.	143 05 E.
	29	1		1	38 36 N.	142 20 E.
	30	14	16	30	38 30 N.	142 25 E.
Apr.	1	3	8	11	39 46 N.	142 47 E.
	2	1	3	4	40 00 N.	142 30 E.
	4	2	9	11	40 20 N.	143 05 E.
	6	2	3	5	41 40 N.	142 25 E.
	9		2	2	40 42 N.	143 18 E.
	12		1	1	39 18 N.	143 50 E.
	13	2	35	37	37 15 N.	145 01 E.
	15	2	10	12	37 20 N.	145 00 E.
	16	2	12	14	36 30 N.	
	18		3	3	37 00 N.	145 00 E.
	19	2	15	17	37 00 N.	145 00 E.
	20	3	3	6	37 00 N.	145 10 E.
	22	7	32	39	37 17 N.	145 50 E.
	23		5	5	37 30 N.	145 50 E.
	26	2		2	40 00 N.	145 30 E.
	28	2	1	3	38 15 N.	145 30 E.
	29	20	29	49	39 13 N.	145 20 E.
	30	1	1	2	39 20 N.	145 25 E.
May	1		1	1	39 20 N.	145 30 E.
	2	35	15	50	39 00 N.	145 33 E.
	3	10	11	21	39 10 N.	145 28 E.
	4		1	1	39 45 N.	145 30 E.
	6	1		1	39 40 N.	145 10 E.
	7		10	10	39 26 N.	145 10 E.
	8	19	37	56	38 57 N.	144 12 E.
	9		1	1	39 00 N.	144 10 E.
	15	2	3	5	39 53 N.	145 36 E.
	21	6	11	17	39 40 N.	147 40 E.
	22	10	30	40	39 45 N.	148 00 E.
	27	2	11	13	39 54 N.	148 10 E.
	28		12	12	40 00 N.	148 05 E.
	29	2	11	13	39 48 N.	148 38 E.
	30	1	5	6	40 00 N.	148 40 E.
June	1		1	1	42 10 N.	147 50 E.
	4		3	3	10 miles SE. of Skotan.	
	5	11	5	16	20 miles E. of Skotan.	
	6	6	11	17	43 50 N.	147 15 E.
	8		1	1	44 00 N.	147 30 E.
	11	2	7	9	45 10 N.	148 40 E.
	12	3	14	17	45 10 N.	148 35 E.
	13		7	7	45 00 N.	148 30 E.
	15		2	2	45 00 N.	148 20 E.
	16	1	[illegible]	4	45 00 N.	148 15 E.
	17	2		2	45 00 N.	149 10 E.
	18	6	1	7	45 00 N.	149 35 E.
Total		207	432	639		

Extract of the sealing log of the American schooner Willard Ainsworth, sealing off the coast of Japan, for the spring season of 1896.

Date.	Males.	Females.	Total.	Latitude.	Longitude.
1896.				° ′	° ′
Mar. 18	2	2	4	38 15 N.	142 16 E.
21	2	3	5	38 59 N.	143 18 E.
22	5	6	11	38 44 N.	143 33 E.
23	6	13	19	38 35 N.	143 30 E.
24	4	6	10	38 35 N.	143 15 E.
25	1	5	6	38 39 N.	143 45 E.
26	2	10	12	38 02 N.	142 40 E.
30	3	13	16	38 40 N.	143 42 E.
31	2	1	3	38 41 N.	143 35 E.
Apr. 1	18	33	51	38 19 N.	143 56 E.
2	2	8	10	38 28 N.	144 01 E.
3	3	20	23	38 47 N.	144 09 E.
4	3	14	17	38 45 N.	144 14 E.
5	4	17	21	39 07 N.	143 55 E.
6	4	27	31	39 12 N.	143 36 E.
9	4	23	27	39 18 N.	144 08 E.
10	1	1	2	39 31 N.	143 47 E.
13	3	7	10	39 21 N.	143 09 E.
16	2	5	7	39 39 N.	144 31 E.
19	1	....	1	39 52 N.	142 12 E.
22	....	1	1	40 30 N.	143 12 E.
23	1	3	4	40 35 N.	144 32 E.
30	....	1	1	At Cape Yerimo.	
May 1	3	2	5	41 13 N.	143 38 E.
3	1	....	1	40 50 N.	143 18 E.
7	4	4	8	41 55 N.	143 00 E.
8	3	4	7	41 40 N.	143 10 E.
9	30	9	39	41 30 N.	143 25 E.
10	3	1	4	41 25 N.	143 20 E.
11	10	10	20	41 29 N.	142 16 E.
12	....	1	1	41 25 N.	142 21 E.
14	13	10	23	41 39 N.	142 39 E.
15	54	7	61	41 41 N.	142 49 E.
16	17	5	22	41 36 N.	142 40 E.
17	8	4	12	41 38 N.	142 50 E.
18	4	4	8	41 32 N.	142 41 E.
19	14	9	23	41 38 N.	142 38 E.
21	4	....	4	41 40 N.	142 20 E.
24	8	11	19	41 42 N.	142 41 E.
25	1	2	3	41 50 N.	143 00 E.
27	2	3	5	41 45 N.	142 55 E.
28	3	7	10	41 40 N.	142 40 E.
29	7	19	26	41 51 N.	143 15 E.
31	....	6	6	41 40 N.	142 55 E.
June 2	....	1	1	41 49 N.	143 44 E.
3	....	1	1	41 38 N.	143 16 E.
4	1	....	1	41 35 N.	143 34 E.
5	3	5	8	42 24 N.	145 25 E.
6	1	6	7	42 59 N.	145 43 E.
7	1	....	1	43 20 N.	146 32 E.
8	2	1	3	43 38 N.	146 39 E.
10	1	2	3	44 20 N.	147 41 E.
11	3	20	23	44 26 N.	147 45 E.
12	6	34	40	44 25 N.	147 39 E.
13	2	1	3	44 32 N.	147 53 E.
15	1	3	4	44 24 N.	147 50 E.
17	7	6	13	44 01 N.	147 25 E.
18	7	2	9	43 45 N.	147 30 E.
19	....	5	5	43 51 N.	147 05 E.
28	1	1	2	41 29 N.	143 00 E.
July 8	1	....	1	47 41 N.	167 03 E.
Total	299	425	724		

Extract of the sealing log of the American schooner Louisa D., sealing off the coast of Japan, for the spring season of 1896.

Date.	Males.	Females.	Total.	Latitude.	Longitude.
1896.				° ′	° ′
Mar. 31	....	1	1	37 03 N.	148 43 E.
Apr. 1	....	1	1	37 10 N.	148 10 E.
3	3	16	19	36 35 N.	147 40 E.
4	2	8	10	37 34 N.	147 30 E.
5	6	....	6	37 31 N.	146 27 E.
6	10	39	49	37 30 N.	146 20 E.
7	....	1	1	37 33 N.	147 20 E.
10	....	7	7	37 25 N.	147 08 E.
12	....	17	17	37 29 N.	146 45 E.
13	....	13	13	37 39 N.	146 06 E.
16	....	17	17	37 30 N.	146 13 E.
18	2	35	37	37 47 N.	146 06 E.
22	....	2	2	38 04 N.	146 15 E.
23	1	1	2	38 58 N.	145 54 E.
26	1	7	8	38 19 N.	147 30 E.
28	1	20	21	38 09 N.	147 39 E.
29	....	13	13	38 54 N.	147 57 E.
30	....	2	2	38 20 N.	147 25 E.
May 2	4	36	40	38 34 N.	146 16 E.
3	10	53	63	38 46 N.	149 22 E
7	3	14	17	33 45 N.	147 16 E.
8	....	1	1	38 46 N.	146 26 E.
9	1	....	1	39 46 N.	145 04 E.
13	1	1	2	41 19 N.	147 34 E.
14	....	3	3	40 10 N.	147 55 E.
15	....	30	30	40 03 N.	148 05 E.
16	5	21	26	40 20 N.	147 56 E.
17	....	10	10	40 19 N.	148 00 E.
18	6	21	27	40 17 N.	147 36 E.
19	1	1	2	39 52 N.	147 20 E.
21	8	32	40	39 54 N.	148 00 E.
22	5	32	37	40 16 N.	148 17 E.
24	....	1	1	40 23 N.	148 22 E.
26	1	....	1	40 06 N.	147 50 E.
27	1	3	4	40 25 N.	148 20 E.
June 24	1	....	1	41 18 N.	155 10 E.
July 4	....	1	1	42 28 N.	179 05 E.
5	1	....	1	42 31 N.	178 55 E.
Total	74	460	534		

Extract of the sealing log of the American schooner Jane Grey, sealing off the coast of Japan, for the spring season of 1896.

Date.	Seals.	Latitude.	Longitude.
1896.		° ′	° ′
Mar. 16	1	37 32 N.	141 45 E.
17	6	37 44 N.	141 49 E.
18	10	38 00 N.	141 25 E.
19	1	38 01 N.	141 20 E.
21	2	38 06 N.	141 56 E.
22	4	38 30 N.	143 02 E.
23	5	39 25 N.	142 21 E.
24	8	38 52 N.	142 07 E.
25	2	38 26 N.	141 55 E.
27	3	40 12 N.	142 34 E.
30	12	41 03 N.	142 48 E.
31	2	40 19 N.	143 26 E.
Apr. 1	24	39 20 N.	144 18 E.
3	9	39 06 N.	144 02 E.
4	4	39 22 N.	144 53 E.
5	16	39 22 N.	143 35 E.
6	25	39 24 N.	144 09 E.
7	1	39 31 N.	144 09 E.
9	18	39 41 N.	144 10 E.
10	25	39 07 N.	143 33 E.
13	17	38 43 N.	144 23 E.
16	4	39 54 N.	142 32 E.
22	31	38 48 N.	144 25 E.
26	2	40 02 N.	142 09 E.
27	1	39 16 N.	142 52 E.
28	5	39 18 N.	143 04 E.
29	1	39 21 N.	143 35 E.
May 2	1	40 57 N.	141 53 E.
3	20	41 31 N.	142 31 E.
7	12	41 33 N.	143 18 E.
8	2	41 39 N.	143 46 E.
9	1	41 31 N.	145 16 E.
11	1	41 49 N.	143 17 E.
13	5	41 57 N.	143 17 E.
14	13	41 57 N.	143 17 E.
15	41	41 56 N.	142 53 E.
16	5	41 56 N.	142 34 E.
19	38	41 20 N.	142 26 E.
21	3	41 22 N.	142 09 E.
22	1	41 41 N.	143 17 E.
June 4	2	42 45 N.	145 46 E.
5	19	*a* 45 03 N.	145 38 E.
7	6	43 25 N.	146 59 E.
11	38	43 56 N.	147 15 E.
12	11	43 42 N.	147 12 E.
14	1	45 05 N.	148 59 E.
15	3	44 34 N.	148 15 E.
16	7	44 56 N.	148 12 E.
18	1	44 47 N.	148 10 E.
19	4	44 56 N.	148 05 E.
20	1	43 45 N.	148 10 E.
24	10	44 44 N.	148 33 E.
July 9	1	53 15 N.	171 36 E.
Total	*b* 483		

a 43° 03′ ? L. S.

b On p. 7 of Statistical Tables Fur-Seal Catch, 1896, from which the above log is copied, the total for this schooner in Japanese waters is given as 487 skins—246 males and 241 females.

Extract of sealing log of the American schooner Rattler, sealing off the coast of Japan, for the spring season of 1890.

Date.	Males.	Females.	Total.	Latitude.	Longitude.
1890.				° ′	° ′
Mar. 17	1	....	1	39 00 N.	143 05 E.
18	3	5	8	39 01 N.	143 51 E.
19	1	3	4	39 08 N.	145 15 E.
21	....	1	1	37 48 N.	145 57 E.
23	2	12	14	36 18 N.	144 19 E.
24	3	37	40	37 30 N.	144 26 E.
25	....	1	1	37 22 N.	144 55 E.
26	1	12	13	37 23 N.	144 50 E.
27	5	38	43	37 20 N.	145 10 E.
Apr. 1	3	31	34	39 09 N.	144 30 E.
2	....	2	2	39 28 N.	144 14 E.
3	2	6	8	39 41 N.	144 11 E.
4	2	18	20	39 19 N.	144 00 E.
5	1	3	4	39 40 N.	144 00 E.
7	....	3	3	38 27 N.	144 22 E.
9	6	65	71	38 22 N.	144 37 E.
10	3	10	13	38 20 N.	144 32 E.
11	....	1	1	38 12 N.	144 47 E.
12	2	....	2	38 29 N.	144 54 E.
13	5	50	55	37 35 N.	144 57 E.
15	....	2	2	37 38 N.	145 13 E.
18	....	7	7	37 31 N.	145 15 E.
21	1	....	1	37 29 N.	145 41 E.
22	3	19	22	37 37 N.	145 30 E.
23	1	1	2	37 33 N.	145 35 E.
24	1	3	4	38 46 N.	145 29 E.
28	3	10	13	40 37 N.	142 15 E.
May 1	....	4	4	41 29 N.	141 29 E.
3	8	7	15	41 35 N.	142 58 E.
7	4	10	14	40 21 N.	144 28 E.
8	5	19	24	39 32 N.	145 06 E.
11	12	21	33	41 47 N.	142 36 E.
13	4	9	13	41 47 N.	142 36 E.
14	10	6	16	41 50 N.	142 30 E.
15	22	39	61	41 45 N.	142 26 E.
16	3	6	9	41 54 N.	142 33 E.
17	1	....	1	41 59 N.	142 00 E.
18	4	6	10	42 05 N.	142 00 E.
19	6	16	22	42 06 N.	141 47 E.
June 9	....	1	1	39 04 N.	162 52 E.
10	....	1	1	40 48 N.	165 06 E.
15	2	3	5	42 20 N.	176 22 E.
25	....	1	1	43 35 N.	178 40 E.
26	2	4	6	43 18 N.	178 54 E.
27	5	10	15	43 20 N.	178 40 E.
29	3	4	7	43 47 N.	177 13 E.
July 1	....	1	1	43 25 N.	176 48 E.
2	1	....	1	43 17 N.	176 19 E.
Total	141	508	649		

Extract of sealing log of the Japanese schooner Third Chishima Maru, of Hakodate, sealing off the coast of Japan, for the spring season of 1896.

[From the official report of the Imperial fisheries bureau, Tokyo, Japan.]

Date.	Position.	Seals.
1896.		
Mar. 2[a]		
9	No position given	11
10	50 miles SSE. of Kinkasan	2
14	13 miles ENE. of Shioyasaki	8
17	No position	1
18	30 miles ESE. of Kinkasan	21
21	Off Kinkasan	3
22	SE. by S. of Kinkasan	21
23	SE. of Kinkasan	10
24	35 miles SE. of Kinkasan	5
30	SE. of Kinkasan	6
Apr. 2	No position	26
3	do	51
4	do	22
5	25 miles E. of Kamaishi	8
6	Near Miako	28
13	No position	26
17	30 miles E. of Kamaishi	25
22	No position	28
23	do	30
27	do	28
29	do	12
May 3	do	21
8	do	18
9	do	23
11	do	16
14	do	18
15	do	26
16	do	32
17	do	38
20	do	6
21	do	13
27	do	10
28	do	5
29	do	11
30	do	9
June 6	do	11

[a] Left Yokohama.

Extract of sealing log of the American schooner Penelope, P. L. Larsen, master, for the spring season of 1895.

Date.	Latitude.	Longitude.	Seals.
1895.	° ′	° ′	
Mar. 20	36 48 N.	144 34 E.	4
21	37 05 N.	145 30 E.	4
24	36 12 N.	145 09 E.	3
26	38 15 N.	147 19 E.	3
Apr. 3	38 44 N.	145 40 E.	2
4	38 49 N.	146 02 E.	4
5	30 39 N.	145 38 E.	9
6	37 35 N.	145 24 E.	37
12	37 20 N.	146 20 E.	1
13	37 35 N.	146 25 E.	30
16	37 30 N.	147 05 E.	4
18	39 13 N.	146 54 E.	1
19	39 23 N.	146 40 E.	4
22	39 46 N.	147 04 E.	15
23	39 40 N.	147 36 E.	4
26	39 45 N.	147 40 E.	1
27	40 10 N.	148 10 E.	1
28	39 58 N.	148 29 E.	10
May 1	39 18 N.	146 32 E.	9
3	40 45 N.	143 90 E.	5
4	40 53 N.	142 56 E.	18
5	40 56 N.	142 58 E.	7
6	41 04 N.	142 40 E.	20
7	41 12 N.	142 45 E.	14
13	40 59 N.	145 30 E.	10
14	41 06 N.	145 45 E.	1
15	41 33 N.	146 36 E.	3
16	40 20 N.	148 06 E.	2
20	41 24 N.	149 10 E.	2
23	42 46 N.	146 53 E.	4
24	42 55 N.	146 33 E.	3
25	42 55 N.	146 20 E.	10
26	42 30 N.	146 10 E.	2
27	42 06 N.	146 05 E.	3
31	42 27 N.	146 09 E.	3
June 5	43 04 N.	137 38 E.	1
7	44 20 N.	138 00 E.	7
8	45 00 N.	140 30 E.	2
15	45 51 N.	144 22 E.	4
17	44 35 N.	143 40 E.	1
July 4	45 40 N.	163 00 E.	2
9	46 17 N.	164 28 E.	1
Total			271

Extract of sealing log of the Japanese schooner Kaio Maru (formerly the Henry Dennis) for the spring season of 1895.

[Translated from Report Japanese Fish Bureau, 1895, pp. 127-131.]

Date.	Latitude.	Longitude.	Seals.
1895.	° ′	° ′	
Mar. 6 *a*	....	....	8
7 *a*	....	....	16
19	37 35 N.	142 35 E.	9
20	37 16 N.	141 48 E.	9
21	37 04 N.	142 00 E.	61
24	37 00 N.	143 00 E.	5
25	37 21 N.	141 20 E.	14
27	38 40 N.	142 25 E.	3
29	38 20 N.	142 00 E.	7
30	38 10 N.	142 10 E.	1
31	36 55 N.	141 30 E.	7
Apr. 1	36 55 N.	141 30 E.	19
2	36 48 N.	141 50 E.	72
3	37 30 N.	142 05 E.	1
4	38 01 N.	142 15 E.	8
5	37 04 N.	142 15 E.	37
6	36 45 N.	142 43 E.	78
15	37 16 N.	142 28 E.	17
16	37 33 N.	142 27 E.	1
13	38 40 N.	142 50 E.	3
19	39 30 N.	142 50 E.	9
20	38 54 N.	142 10 E.	14
22	38 33 N.	142 00 E.	45
23	....	....	14
26	36 52 N.	141 45 E.	15
27	36 55 N.	141 55 E.	6
28	37 48 N.	143 10 E.	23
29	38 15 N.	141 45 E.	16
May 1	38 00 N.	142 00 E.	4
7	41 03 N.	143 00 E.	5
9	40 20 N.	142 45 E.	8
12	41 40 N.	142 30 E.	7
13	42 25 N.	142 10 E.	13
14	41 50 N.	141 30 E.	11
15	42 10 N.	141 35 E.	4
16	41 47 N.	141 05 E.	4
20	41 52 N.	143 20 E.	10
24	41 57 N.	143 22 E.	9
25	42 25 N.	144 04 E.	5
26	42 55 N.	145 03 E.	3
27	42 57 N.	145 27 E.	2
31	44 14 N.	147 36 E.	13
June 1	43 36 N.	147 10 E.	4
2	43 08 N.	146 21 E.	11
4	41 50 N.	142 00 E.	7
Total	....	....	633

a Position uncertain.

The log of the Japanese schooner *Unohi Maru*, of Hakodate, for 1895, is not given in full. Mr. T. Nagasi, who was placed on board, only stayed from March 10 to April 13 (Rep. Jap. Fisheries Bureau, 1895, pp. 132–139), but a short summary, without positions, is given by the owner, Mr. K. Tsudzi (op. cit., p. 141), as follows:

Month.	Number of hunting days.	Number of hunting hours.	Seals taken.
1895.		*h.* *m.*	
March	9	68 00	62
April	14	115 25	186
May	13	128 45	188
June	6	83 18	66
Total	42	395 28	502

Extract of sealing log of the American schooner Herman, Scott, master, for the spring season of 1895.

[From Townsend's report.]

Date.	Latitude.	Longitude.	Seals.	Remarks.
1895.	° ′	° ′		
Mar. 20	36 47 N.	145 26 E.	1	Observation.
21	36 45 N.	145 40 E.	4	
27	36 40 N.	145 05 E.	1	
Apr. 1	36 44 N.	146 20 E.	40	
2	36 39 N.	146 06 E.	26	
3	36 44 N.	145 50 E.	2	Dead reckoning.
5	36 40 N.	146 24 E.	4	Do.
11	38 38 N.	146 17 E.	1	Do.
12	39 02 N.	146 14 E.	7	
13	38 48 N.	146 32 E.	13	
15	38 06 N.	146 35 E.	9	
16	37 30 N.	146 28 E.	21	
18	37 28 N.	146 52 E.	5	
19	37 30 N.	146 35 E.	7	
23	39 27 N.	143 02 E.	1	
25	39 25 N.	142 51 E.	5	
26	39 22 N.	142 45 E.	4	
27	39 23 N.	142 25 E.	5	
28	39 31 N.	142 21 E.	66	
29	39 27 N.	142 40 E.	3	
30	39 36 N.	142 30 E.	11	
May 1	39 26 N.	142 31 E.	17	
3	40 22 N.	142 28 E.	7	
4	40 31 N.	142 16 E.	38	
5	40 38 N.	142 31 E.	9	
6	40 59 N.	141 56 E.	19	
7	40 54 N.	141 47 E.	23	
8	41 12 N.	142 00 E.	2	
9			5	20 to 40 miles E. off C. Yesan.
10			11	C. Yesan, W., about 20 miles.
12	41 53 N.	142 18 E.	10	
13	42 13 N.	141 26 E.	10	
14	41 48 N.	142 25 E.	32	
15	42 07 N.	142 40 E.	18	
16	41 51 N.	142 31 E.	1	
17			1	C. Yerimo, N., 20 miles.
20	41 49 N.	142 27 E.	29	
23	41 58 N.	142 07 E.	19	
24	41 50 N.	142 20 E.	29	
25			13	C. Yerimo, ENE. ½ E.
26			9	Distance, 30 miles.
June 1			2	Skotan, NW., 15 miles.
2			14	Skotan, NNE., 10 miles.
7			16	Iturup, W. end, NW., 25 miles.
8			8	Do.
10			23	Iturup, S. side, W. end, W., 25 miles.
12			1	Jap Bay, Iturup, N., 10 miles.
13	44 57 N.	147 51 E.	13	
14			2	Iturup, W. end, NW., 25 miles.
15			7	Iturup, W. end, NNW., 35 miles.
16			1	Otter Island, N., 6 miles, S. of Iturup.
17			5	Otter Island, N., 10 miles.
18			6	Iturup, W. end, NNW., 12 miles.
23	45 19 N.	149 27 E.	1	
Total			637	

Extract of sealing log of the American schooner Edward E. Webster, A. C. Folger, master, for the spring season of 1895.

[From Townsend's report.]

Date.		Latitude.	Longitude.	Seals.	Remarks.
	1895.	° ′	° ′		
Mar.	20	37 22 N.	141 55 E.	15	Observation.
	21	37 34 N.	142 04 E.	100	
	22	37 17 N.	141 45 E.	14	
	24	37 38 N.	143 02 E.	1	
Apr.	3	38 46 N.	145 00 E.	10	
	4	39 06 N.	143 53 E.	11	
	8	39 10 N.	142 31 E.	21	
	10	39 08 N.	142 20 E.	12	
	11	38 53 N.	142 26 E.	21	
	14	38 50 N.	142 30 E.	3	
	19	39 48 N.	142 32 E.	25	
	20	39 47 N.	142 39 E.	3	
	22	39 37 N.	143 26 E.	2	
	23	39 24 N.	....	5	Longitude not noted on log.
	27	39 49 N.	142 32 E.	36	
	28	39 50 N.	142 17 E.	44	
	30	39 45 N.	142 24 E.	4	
May	2	41 26 N.	143 02 E.	10	
	3	41 50 N.	142 53 E.	3	
	4	41 53 N.	142 02 E.	15	
	5	42 18 N.	141 24 E.	8	
	6	*a* 41 14 N.	141 20 E.	34	
	7	42 11 N.	141 18 E.	34	
	8	42 20 N.	141 16 E.	6	
	10	42 16 N.	141 05 E.	10	
	12	42 27 N.	....	12	Do.
	13	42 09 N.	141 00 E.	8	
	14	....	....	23	Position not on log.
	15	41 47 N.	143 05 E.	28	
	23	43 04 N.	146 55 E.	13	
	24	43 18 N.	146 51 E.	18	
	25	43 24 N.	146 24 E.	41	
	26	43 26 N.	146 23 E.	4	
	31	43 26 N.	146 23 E.	4	
June	1	43 28 N.	146 50 E.	8	
	2	43 50 N.	147 02 E.	9	
	6	44 10 N.	147 10 E.	27	
	7	....	....	29	Do.
	8	....	....	18	Do.
	10	....	....	25	Do.
	13	44 20 N.	147 30 E.	9	
	14	....	....	9	Do.
	15	....	....	15	Do.
	18	44 12 N.	147 15 E.	9	
	19	....	....	5	Do.
Total		....	....	756	

a 42 (?) L. S.

Extract of sealing log of the American schooner Alton, A. J. Anderson, master, for the spring season of 1895.

[From Townsend's report.]

Date.	Latitude.	Longitude.	Seals.
1895.	° ′	° ′	
Mar. 26	36 40 N.	141 23 E.	6
27	37 07 N.	141 54 E.	1
29	37 50 N.	144 00 E.	1
30	38 59 N.	144 00 E.	3
Apr. 2	38 55 N.	144 57 E.	14
7	41 40 N.	143 28 E.	1
10	41 18 N.	141 52 E.	1
11	40 14 N.	142 51 E.	20
12	39 53 N.	143 07 E.	40
15	39 33 N.	142 45 E.	5
17	39 55 N.	143 5– E.	1
18	39 42 N.	143 40 E.	31
19	39 56 N.	144 00 E.	16
20	39 34 N.	143 00 E.	12
22	39 47 N.	143 05 E.	19
May 1	39 06 N.	143 00 E.	3
3	40 14 N.	142 49 E.	6
4	40 24 N.	142 52 E.	56
5	40 18 N.	142 48 E.	20
6	40 30 N.	142 17 E.	9
7	a 40 89 N.	142 50 E.	6
9	41 50 N.	142 15 E.	4
10	41 33 N.	143 00 E.	16
15	42 13 N.	145 41 E.	3
16	42 26 N.	144 00 E.	1
19	40 14 N.	142 49 E.	1
20	40 22 N.	142 56 E.	3
June 10	41 30 N.	142 16 E.	4
11	41 36 N.	142 51 E.	3
15	43 00 N.	145 40 E.	2
18	42 03 N.	147 04 E.	3
Total			311

[a] 40°39′ (?) L. S.

Extract of sealing log of the American schooner Bonanza, George Wester, master, for the spring season of 1895.

[From Townsend's report.]

Date.	Latitude.	Longitude.	Seals.	Remarks.
1895.	° ′	° ′		
Mar. 30	39 27 N.	146 22 E.	11	Observation.
Apr. 2	38 33 N.	144 20 E.	5	
3	39 26 N.	142 40 E.	7	
5	39 29 N.	142 07 E.	5	Dead reckoning.
13	37 26 N.	145 01 E.	27	Observation.
16	37 15 N.	145 44 E.	26	
18	36 41 N.	145 08 E.	16	
19	36 30 N.	145 01 E.	13	
23	39 48 N.	142 40 E.	6	Dead reckoning.
25	39 28 N.	142 37 E.	10	Observation.
26	39 28 N.	142 38 E.	2	
27	39 48 N.	142 48 E.	41	
28	39 48 N.	142 14 E.	56	
30	39 36 N.	142 16 E.	1	Dead reckoning.
May 1	39 16 N.	142 21 E.	38	Observation.
3	40 56 N.	142 08 E.	23	
4	41 07 N.	142 16 E.	124	
5	41 07 N.	141 58 E.	41	
6	41 21 N.	141 58 E.	61	
7	41 42 N.	142 10 E.	42	
8	41 34 N.	141 54 E.	9	
9	41 31 N.	141 36 E.	5	Dead reckoning.
10			26	
12	42 07 N.	142 02 E.	19	Observation.
13	42 03 N.	141 59 E.	63	
14	41 52 N.	142 08 E.	40	
15	41 49 N.	142 27 E.	26	
17			9	
23	42 33 N.	145 53 E.	11	Do.
24	42 42 N.	145 47 E.	19	
25	42 42 N.	145 46 E.	57	
26	42 48 N.	145 34 E.	2	
27	42 58 N.	145 30 E.	2	
28	42 58 N.	145 59 E.	1	
30	42 32 N.	146 35 E.	8	
31	43 11 N.	147 30 E.	5	
June 2	43 05 N.	146 32 E.	8	
5	43 38 N.	146 58 E.	2	
6	43 31 N.	146 50 E.	13	
7	43 43 N.	147 04 E.	10	Dead reckoning.
8			1	
10	43 23 N.	146 42 E.	3	Observation.
14	43 50 N.	147 10 E.	9	Dead reckoning.
16			2	
17	43 43 N.	146 52 E.	9	Do.
18	44 01 N.	147 51 E.	17	Observation.
Total			926	

Extract of sealing log of the American schooner Bowhead, W. P. Noyes, master, for the spring season of 1895.

[From Townsend's report.]

Date.	Latitude.	Longitude.	Seals.		
			Males.	Females.	Total.
1895.	° ′	° ′			
Mar. 25	36 48 N.	146 01 E.	1	9	10
27	36 40 N.	145 50 E.	3	11	14
30	36 42 N.	145 10 E.	....	2	2
Apr. 1	36 21 N.	145 48 E.	3	24	27
2	36 20 N.	146 01 E.	10	46	56
3	36 26 N.	145 43 E.	6	17	23
5	36 37 N.	146 00 E.	2	6	8
6	36 05 N.	145 36 E.	4	12	16
9	37 11 N.	146 28 E.	1	1	2
12	37 01 N.	146 09 E.	1	....	1
13	37 12 N.	146 08 E.	8	27	35
15	37 17 N.	146 31 E.	7	23	30
16	39 09 N.	146 40 E.	8	7	15
17	39 26 N.	146 34 E.	1	1	2
18	39 40 N.	147 17 E.	5	7	12
19	39 38 N.	147 22 E.	11	14	25
20	30 50 N.	147 25 E.	1	3	4
21	39 57 N.	148 08 E.	....	1	1
22	39 40 N.	148 40 E.	3	3	6
23	40 12 N.	148 30 E.	16	22	38
26	40 10 N.	148 35 E.	3	5	8
28	39 58 N.	148 30 E.	8	14	22
May 1	39 48 N.	148 02 E.	42	54	96
4	40 00 N.	148 15 E.	2	2	4
5	40 20 N.	148 18 E.	10	14	24
6	40 10 N.	148 12 E.	17	26	43
7	40 12 N.	148 12 E.	8	4	12
8	40 01 N.	148 34 E.	11	10	21
9	40 08 N.	147 53 E.	7	....	7
11	40 18 N.	148 30 E.	2	....	2
13	40 39 N.	148 40 E.	2	1	3
16	40 26 N.	146 48 E.	3	1	4
20	41 00 N.	146 44 E.	1	....	1
24	42 16 N.	145 50 E.	5	2	7
25	42 45 N.	145 36 E.	8	14	22
26	42 50 N.	145 50 E.	....	1	1
27	42 53 N.	145 30 E.	1	....	1
30	42 28 N.	145 50 E.	3	1	4
31	42 45 N.	145 35 E.	4	2	6
June 2	43 10 N.	145 55 E.	9	1	10
5	43 15 N.	146 22 E.	5	6	11
6	42 56 N.	146 06 E.	2	2	4
7	43 00 N.	146 05 E.	1	....	1
15	43 35 N.	147 10 E.	1	1	2
17	43 37 N.	147 15 E.	....	1	1
18	43 56 N.	147 58 E.	16	5	21
Total	....	....	262	403	665

Extract of sealing log of the American schooner Winchester, Frank Johnson, master, for the spring season of 1895.

[From Townsend's report.]

Date.	Latitude.	Longitude.	Seals.
1895.	° ′	° ′	
Mar. 21	36 22 N.	144 30 E.	52
24	36 14 N.	147 00 E.	9
27	36 21 N.	145 06 E.	16
30	36 15 N.	145 33 E.	1
Apr. 1	36 30 N.	146 10 E.	33
2	36 39 N.	146 02 E.	25
3	36 25 N	145 49 E.	38
5	36 25 N.	145 49 E.	16
6	36 26 N.	146 25 E.	7
15	39 38 N.	142 29 E.	18
16	39 15 N.	142 46 E.	18
17	40 04 N.	142 56 E.	4
18	40 06 N.	143 00 E.	13
19	39 55 N.	143 25 E.	44
23	40 37 N.	143 42 E.	8
26	42 22 N.	145 02 E.	1
27	42 37 N.	144 40 E.	2
May 4	42 25 N.	144 30 E.	9
5	42 00 N.	145 24 E.	1
6	41 11 N.	146 10 E.	13
8	39 46 N.	148 52 E.	8
9	39 39 N.	146 20 E.	14
10	39 37 N.	146 49 E.	50
12	39 32 N.	146 13 E.	32
13	40 00 N.	147 08 E.	11
14	39 54 N.	147 13 E.	3
15	39 53 N.	147 41 E.	6
16	40 12 N.	147 30 E.	4
20	40 44 N.	147 19 E.	5
25	42 29 N.	147 21 E.	20
30	40 09 N.	146 45 E.	4
June 1	43 15 N.	147 00 E.	1
2	43 20 N.	147 26 E.	11
5	42 59 N.	147 40 E.	3
6	43 33 N.	147 49 E.	5
7	43 43 N.	147 27 E.	10
8	43 57 N.	147 07 E.	6
9	43 47 N.	147 16 E.	1
10	43 40 N.	147 03 E.	4
13	43 30 N.	148 19 E.	16
14	43 37 N.	148 14 E.	14
15	43 29 N.	147 51 E.	9
17	43 29 N.	147 12 E.	10
18	47 40 N.	147 40 E.	5
19	43 30 N.	148 16 E.	6
30	49 30 N.	158 52 E.	3
Total			589

Extract of sealing log of the American schooner Sophia Sutherland, A. C. Sutherland, master, for the spring season of 1895.

[From Townsend's report.]

Date.	Latitude.	Longitude.	Seals.
1895.	° ′	° ′	
Mar. 9	36 16 N.	144 36 E.	1
13	36 53 N.	141 46 E.	3
21	36 26 N.	144 45 E.	54
24	38 13 N.	142 27 E.	12
30	39 27 N.	143 28 E.	6
Apr. 2	38 01 N.	145 53 E.	21
6	38 05 N.	143 51 E.	1
7	38 37 N.	142 53 E.	2
8	39 42 N.	142 49 E.	3
11	38 01 N.	145 43 E.	7
12	37 33 N.	145 05 E.	13
13	37 27 N.	145 29 E.	11
15	37 50 N.	145 03 E.	1
16	38 47 N.	145 50 E.	3
18	39 15 N.	145 01 E.	1
19	38 44 N.	145 37 E.	6
22	39 20 N.	144 56 E.	1
23	39 56 N.	145 31 E.	28
27	39 42 N.	145 37 E.	2
30	40 41 N.	142 21 E.	17
May 8	41 21 N.	142 31 E.	15
9	41 05 N.	142 20 E.	45
10	41 13 N.	141 47 E.	21
12	40 54 N.	142 19 E.	3
13	41 31 N.	143 08 E.	11
16	41 22 N.	145 38 E.	2
17	40 06 N.	150 14 E.	1
19	42 02 N.	152 23 E.	1
Total			292

Extract of sealing log of the American schooner Rattler, Frederick Nielsen, master, for the spring season of 1895.

[From Townsend's report.]

Date.	Latitude.	Longitude.	Seals.		
			Males.	Females.	Total.
1895.	° ′	° ′			
Apr. 11	39 22 N.	142 41 E.	10	12	22
12	39 18 N.	142 32 E.	21	17	38
13	39 45 N.	142 45 E.	2	1	3
15	39 54 N.	142 35 E.	7	2	9
16	40 59 N.	142 01 E.		2	2
18	40 13 N.	143 55 E.	1		1
19	39 41 N.	144 16 E.	19	39	58
23	39 35 N.	144 48 E.		4	4
28	39 08 N.	145 11 E.		2	2
May 1	39 42 N.	144 55 E.	4	21	25
3	40 58 N.	143 11 E.	2	5	7
4	40 41 N.	142 58 E.	11	36	47
5	40 40 N.	142 35 E.	3	7	10
7	41 01 N.	142 47 E.	4	4	8
9	42 08 N.	142 16 E.	8	2	10
10	42 07 N.	142 08 E.	12	3	15
12	41 55 N.	142 17 E.	5		5
13	41 42 N.	142 38 E.	11	17	28
14	41 40 N.	142 43 E.	3	4	7
15	41 23 N.	143 32 E.	3		3
16	41 55 N.	143 47 E.	1		1
24	41 52 N.	144 42 E.	3	1	4
25	41 40 N.	144 00 E.	2		2
26	41 38 N.	142 25 E.	11	17	28
27	41 38 N.	142 25 E.	4	2	6
June 1	42 08 N.	142 10 E.	4	1	5
2	42 08 N.	142 10 E.	1	7	8
4	42 10 N.	142 00 E.	2	7	9
5	41 33 N.	143 24 E.	2		2
6	42 11 N.	144 38 E.	5	11	16
7	42 39 N.	145 32 E.	3	8	11
8	43 06 N.	146 11 E.		1	1
10	43 10 N.	147 16 E.		2	2
11	43 10 N.	147 16 E.	1		1
15	43 10 N.	147 16 E.	1	4	5
18	44 06 N.	148 14 E.	2		2
Total			168	239	407

Extract of sealing log of the American schooner Jane Gray, S. H. Burtis, master, for the spring season of 1895.

[From Townsend's report.]

Date.	Latitude.	Longitude.	Seals.
1895.	° ′	° ′	
Mar. 24	35 58 N.	141 08 E.	2
25	37 12 N.	141 18 E.	31
26	37 06 N.	141 20 E.	2
27	37 30 N.	141 37 E.	12
29	38 06 N.	141 55 E.	21
30	38 08 N.	142 22 E.	9
Apr. 2	37 40 N.	143 20 E.	23
3	38 07 N.	142 30 E.	11
5	38 29 N.	142 20 E.	6
9	39 31 N.	142 25 E.	9
12	37 40 N.	142 21 E.	2
15	40 19 N.	143 13 E.	14
16	40 27 N.	143 15 E.	30
17	40 28 N.	142 05 E.	7
18	40 15 N.	142 16 E.	10
19	40 11 N.	142 25 E.	75
20	40 09 N.	142 24 E.	11
22	40 50 N.	143 00 E.	71
23	40 00 N.	143 00 E.	30
25	39 37 N.	142 22 E.	5
27	39 58 N.	142 30 E.	58
28	40 09 N.	142 12 E.	19
30	40 50 N.	142 15 E.	4
May 1	40 54 N.	142 00 E.	6
2	41 54 N.	142 00 E.	32
3	41 54 N.	142 00 E.	33
4	41 54 N.	142 00 E.	80
5	41 54 N.	142 00 E.	32
6	41 54 N.	142 00 E.	94
7	41 54 N.	142 00 E.	55
9	41 54 N.	142 00 E.	1
10	41 54 N.	142 00 E.	16
13	41 54 N.	142 00 E.	14
14	41 30 N.	142 10 E.	24
15	41 25 N.	142 15 E.	51
16	41 25 N.	142 15 E.	8
20	41 55 N.	142 40 E.	26
21	41 40 N.	142 40 E.	4
23	41 35 N.	142 15 E.	19
24	41 25 N.	142 15 E.	23
25	41 45 N.	142 45 E.	14
26	41 42 N.	142 49 E.	19
27	41 36 N.	142 46 E.	2
June 1	41 06 N.	143 20 E.	2
2	41 06 N.	143 20 E.	1
3	41 06 N.	143 20 E.	4
5	42 30 N.	146 24 E.	1
6	42 44 N.	146 20 E.	10
7	42 55 N.	146 16 E.	12
13	43 47 N.	148 35 E.	10
14	44 00 N.	147 10 E.	10
15	44 15 N.	[a] 146 10 E.	5
17	44 10 N.	146 55 E.	10
18	44 18 N.	147 03 E.	7
19	44 12 N.	147 28 E.	4
23	44 10 N.	147 40 E.	6
24	43 21 N.	148 00 E.	5
Total			1,111

[a] Position (?) L. S.

Extract of sealing log of the American schooner Ida Etta, Hughes, master, for the spring season of 1895.

[From Townsend's report.]

Date.		Latitude.	Longitude.	Seals.	Remarks.
1895.		° ′	° ′		
Mar.	25	36 15 N.	142 25 E.	2	
	30			7	
Apr.	1	36 32 N.	144 47 E.	11	
	2			1	
	3			2	15 miles offshore.
	4			2	
	5			6	
	6			14	
	7	39 41 N.	144 11 E.		
	12	39 48 N.	143 56 E.	21	
	18	40 06 N.	146 07 E.	5	
	19			24	
	22	39 06 N.	146 49 E.	2	
	23	39 42 N.	146 27 E.	16	
	28	39 44 N.	145 58 E.	34	
May	1	40 30 N.	145 55 E.	37	
	3	41 45 N.	144 00 E.	1	
	4			3	Off Cape Yerimo NW. 15 miles.
	5			17	Off Cape Yerimo NNE. 10 miles.
	6			32	Off Cape Yerimo N. 20 miles.
	7			24	Off Cape Yerimo WNW. 15 miles.
	8			25	Off Cape Yerimo WNW. 8 miles.
	9			16	Off Cape Yerimo E. by N. 20 miles.
	10			20	Off Cape Yerimo E. 25 miles.
	12			16	Off Cape Yerimo ENE. 20 miles.
	16	40 03 N.	146 02 E.	32	
	20	39 57 N.	146 25 E.	35	
	23	40 20 N.	145 44 E.	15	
	24	40 12 N.	146 30 E.	33	
	25	39 57 N.	145 55 E.	29	
	27	40 03 N.	146 19 E.	5	
	30	39 50 N.	145 55 E.	4	
June	2	39 55 N.	145 46 E.	21	
	3	39 15 N.	146 00 E.	1	
	5	39 30 N.	146 10 E.	31	
	6	39 38 N.	146 29 E.	31	
	7	39 36 N.	146 26 E.	9	
Total				564	

Extract of sealing log of the American schooner Allie I. Algar, Jones, master, for the spring season of 1895.

[From Townsend's report.]

Date.	Latitude.	Longitude.	Seals.		
			Males.	Females.	Total.
1895.	° ′	° ′			
Mar. 7	36 24 N.	141 39 E.	6	5	11
9	37 00 N.	141 00 E.	1	0	1
11	36 39 N.	142 13 E.	50	17	67
12	36 24 N.	141 59 E.	12	4	16
14	36 33 N.	142 18 E.	10	5	15
20	37 00 N.	143 35 E.	8	3	11
21	37 09 N.	143 25 E.	1	3	4
22	37 47 N.	142 14 E.	2	0	2
24	37 22 N.	141 41 E.	20	8	28
26	37 20 N.	142 18 E.	5	7	12
29	38 57 N.	143 35 E.	12	8	20
30	39 14 N.	142 48 E.	14	4	18
Apr. 3	37 35 N.	142 25 E.	5	1	6
5	37 50 N.	141 53 E.	0	1	1
12	38 07 N.	146 32 E.	1	0	1
13	37 59 N.	145 50 E.	18	7	25
15	37 22 N.	145 50 E.	12	7	19
16	37 35 N.	147 07 E.	5	2	7
17	39 05 N.	146 15 E.	1	4	5
18	39 14 N.	146 35 E.	49	19	68
19	39 37 N.	146 23 E.	32	22	54
22	39 33 N.	146 07 E.	31	22	53
23	39 44 N.	145 45 E.	29	15	44
May 4	41 54 N.	144 30 E.	4	2	6
5	41 49 N.	143 55 E.	3	1	4
6	41 28 N.	142 56 E.	39	13	52
7	41 29 N.	142 28 E.	51	11	62
8	41 21 N.	142 00 E.	2	4	6
9	42 00 N.	141 40 E.	2	0	2
10	41 15 N.	142 40 E.	6	3	9
11	41 43 N.	142 48 E.	1	0	1
12	42 00 N.	142 52 E.	5	4	9
13	41 57 N.	142 49 E.	37	15	52
14	42 10 N.	142 40 E.	15	11	26
15	41 39 N.	142 50 E.	19	11	30
23	43 12 N.	146 39 E.	9	3	12
24	42 23 N.	146 40 E.	39	9	48
25	43 27 N.	146 36 E.	37	7	44
26	43 24 N.	146 21 E.	3	1	4
27	43 28 N.	146 40 E.	5	1	6
June 2	43 00 N.	146 59 E.	3	1	4
5	43 37 N.	147 00 E.	1	0	1
6	43 50 N.	147 11 E.	9	5	14
7	43 53 N.	147 14 E.	23	3	26
8	44 00 N.	147 20 E.	6	3	9
10	44 17 N.	147 40 E.	19	17	36
11	44 50 N.	148 47 E.	0	2	2
13	45 14 N.	149 00 E.	4	1	5
15	45 00 N.	148 55 E.	4	3	7
17	44 05 N.	148 40 E.	9	4	13
18	44 40 N.	147 45 E.	20	3	23
30	49 09 N.	157 13 E.	1	0	1
July 1	43 35 N.	156 25 E.	1	0	1
Total			701	302	1,003

Extract of sealing log of the Japanese schooner First Chishima Maru, of Hakodate, for the spring season of 1894.

[Translated from Report Japanese Fish Bureau, 1894, pp. 75-83.]

Date.	Weather.	Position of vessel.	Latitude.			Longitude.			Seals.
			°	′	″	°	′	″	
1894.									
Feb. 2	Clear	Hakodate to Mororan							
3	Cloudy	Mororan Bay							
4	do	Mororan to off Nambu							
5	do	Off Shiriya	41	08	20 N.	141	54	40 E.	
6	Clear	At sea	39	32	30 N.	141	32	00 E.	
7	do	do	38	52	20 N.	141	36	00 E.	3
8	Rain	do							
9	Cloudy	do	37	22	16 N.	141	46	20 E.	
10	do	Off Kinkasan	37	57	30 N.	142	10	00 E.	
11	Rain	At sea	36	43	30 N.	143	3	30 E.	1
12	Cloudy	do	33	47	20 N.	143	11	30 E.	
13	do	do	33	15	20 N.	143	00	00 E.	
14	do	do	33	52	30 N.	143	14	20 E.	
15	Clear	Off Inuboye	35	42	20 N.	141	54	30 E.	
16	Cloudy	At sea	36	13	30 N.	142	20	00 E.	
17	Clear	do	36	54	00 N.	141	34	00 E.	
18	do	Yoseiso anchorage	38	19	00 N.	141	37	30 E.	
19	do	do	38	23	30 N.	141	32	00 E.	
20	Cloudy	do	38	22	20 N.	141	32	00 E.	
21	do	do	38	23	20 N.	141	32	00 E.	
22	do	do	38	23	20 N.	141	32	00 E.	
23	do	Yoseiso to Str. Kinkasan	38	18	00 N.	141	22	00 E.	
24	Clear	Anchor in Str. Kinkasan	38	18	00 N.	141	32	00 E.	
25	do	do	38	18	00 N.	141	32	20 E.	
26	Cloudy	do	38	18	00 N.	141	32	20 E.	
28	do	Off Kinkasan	38	31	15 N.	142	32	20 E.	
Mar. 1	do	do	38	30	00 N.	143	00	00 E.	1
2	do	At sea	38	34	40 N.	142	37	50 E.	
3	Rain	Kinkasan to Ayakana	37	57	30 N.	142	09	30 E.	
4	Cloudy		38	17	40 N.	141	31	00 E.	
5	do	Ayakana to Kinkasan	38	18	00 N.	141	36	10 E.	
6	Clear	At sea	38	18	00 N.	142	15	00 E.	
7	Cloudy	do	38	20	30 N.	142	10	00 E.	
8	do	Off Kinkasan	38	02	20 N.	142	10	30 E.	
9	Rain	At sea	38	33	35 N.	142	20	00 E.	
10	do	Off Kinkasan	38	10	25 N.	141	31	00 E.	
11	Cloudy	Anch. Str. Kinkasan	38	08	00 N.	141	26	00 E.	
12	Clear	do	38	18	00 N.	141	32	20 E.	
13	do	Yamakishi to off Kinkasan	38	05	40 N.	142	11	40 E.	2
14	do	At sea	37	30	40 N.	142	17	20 E.	3
15	do	do	37	00	55 N.	142	07	40 E.	28
16	Cloudy	do	38	10	30 N.	142	11	20 E.	1
17	do	do	38	13	10 N.	142	11	20 E.	
18	do	do	38	17	20 N.	142	16	30 E.	
19	do	do	38	11	50 N.	142	31	00 E.	
20	Clear	do	38	00	00 N.	142	12	10 E.	
21	do	do	38	00	02 N.	142	12	40 E.	
22	do	do	38	20	00 N.	142	35	20 E.	44
23	do	do	37	49	50 N.	142	00	00 E.	6
24	½ clear	do	36	52	20 N.	142	09	30 E.	2
25	Cloudy	do	40	11	30 N.	141	55	30 E.	
26	do	Anch. Miyako Bay	39	40	00 N.	142	02	20 E.	
27	Fog	do	39	37	50 N.	141	58	20 E.	
28	Rain	do	39	37	50 N.	141	58	20 E.	
29	Cloudy	do	39	37	50 N.	141	58	20 E.	
30	½ clear	Off Osaki	39	38	00 N.	142	03	30 E.	
31	Cloudy	At sea	38	16	00 N.	142	49	00 E.	
Apr. 1	½ clear	do	38	26	40 N.	142	52	10 E.	
2	Cloudy	do	38	36	30 N.	143	01	30 E.	10
3	Clear	do	38	42	20 N.	143	25	00 E.	27
4	do	do	39	13	30 N.	143	42	30 E,	12
5	do	do	39	22	30 N.	143	32	30 E.	6
6	Cloudy	do	39	24	30 N.	143	40	00 E.	3
7	do	do	39	30	00 N.	143	36	30 E.	35
8	Fog	do	39	27	30 N.	143	40	00 E.	20
9	Cloudy, rain	do	39	28	30 N.	144	00	00 E.	
10	Rain	Bay of Miyako (?)	37	31	30 N.	145	17	30 E.	
11	Cloudy	At sea	37	26	40 N.	142	30	30 E.	
12	Clear	Off Kinkasan	38	10	40 N.	141	44	18 E.	
13	Cloudy	Bay of Miyako	39	37	50 N.	141	58	20 E.	
14	Rain	do	39	37	50 N.	141	58	20 E.	
15	do	do	39	37	50 N.	141	58	20 E.	
16	do	do	39	37	50 N.	141	58	20 E.	
17	Cloudy	Off Baki	39	37	50 N.	141	58	20 E.	
18	Clear	Off Yamada	39	20	24 N.	142	09	21 E.	6
19	Cloudy	Off Kamaishi	39	13	40 N.	142	12	20 E.	1

Extract of sealing log of the Japanese schooner First Chishima Maru, of Hakodate, for the spring season of 1894—**Continued.**

[Translated from Report Japanese Fish Bureau, 1894, pp. 75-83.]

Date.	Weather.	Position of vessel.	Latitude.			Longitude.			Seals.
1894.			°	′	″	°	′	″	
Apr. 20	Cloudy	Off Yamada	39	22	00 N.	142	27	30 E.	24
21	Rain	At Kamaishi	39	15	00 N.	141	54	20 E.	
22	Clear	Off Kamaishi	39	18	40 N.	142	07	00 E.	4
23	½ clear	At sea	39	29	57 N.	142	36	56 E.	16
24	Clear	do	39	34	00 N.	142	26	00 E.	
25	Cloudy	do	39	44	21 N.	142	26	20 E.	14
26	do	Anch. Bay Miyako	39	38	10 N.	142	03	40 E.	
27	Rain	do	39	37	50 N.	141	58	20 E.	
28	do	do	39	37	50 N.	141	58	30 E.	
29	½ clear	do	39	37	50 N.	141	58	30 E.	
30	Cloudy	Off Miyako	39	37	50 N.	141	58	30 E.	
May 1	do	At sea	39	43	20 N.	142	57	30 E.	
2	Clear	do	39	20	38 N.	144	15	20 E.	
3	½ clear	do	41	07	25 N.	144	14	20 E.	1
4	Rain	do	40	34	10 N.	142	34	20 E.	
5	½ clear	do	40	42	30 N.	142	18	01 E.	3
6	do	do	40	52	45 N.	141	53	20 E.	
7	Cloudy	do	40	35	30 N.	142	15	00 E.	13
8	do	do	40	38	20 N.	142	17	18 E.	1
9	do	do	40	51	20 N.	142	08	30 E.	
10	do	do	39	56	00 N.	142	56	40 E.	
11	do	do	40	12	10 N.	142	18	25 E.	1
12	do	do	39	52	10 N.	142	13	00 E.	22
13	Fog, cloudy	do	39	37	30 N.	142	22	15 E.	
14	Clear	do	39	38	48 N.	142	38	10 F.	20
15	Cloudy	do	41	07	25 N.	142	14	20 E.	
16	Fog	do	40	41	25 N.	142	18	30 E.	6
17	½ clear	do	41	15	36 N.	142	30	00 E.	9
18	Rain	do	41	21	40 N.	142	14	00 E.	3
19	Cloudy	do	41	35	35 N.	142	47	20 E.	5
20	do	do	41	27	40 N.	142	04	35 E.	11
21	do	Off Yesan	41	46	50 N.	141	40	00 E.	9
22	do	Off Mororan	42	16	00 N.	141	43	30 E.	1
23	do	At sea	42	15	00 N.	141	22	30 E.	
24	do	Harbor Mororan	42	17	10 N.	140	52	40 E.	
25	do	Off Mororan	42	18	30 N.	140	56	30 E.	
26	Clear, fog	Off Shabiura	42	03	30 N.	141	19	20 E.	
27	½ clear, fog	Off Yesan	41	50	00 N.	141	10	10 E.	
28	Clear, fog	At sea	41	14	20 N.	142	04	50 E.	7
29	do	do	41	50	00 N.	141	57	30 E.	4
30	½ clear	do	41	52	17 N.	142	08	30 E.	17
31	Clear	do	41	46	24 N.	142	03	15 E.	4
June 1	½ clear	do	41	37	20 N.	142	35	30 E.	19
2	Heavy fog	do	41	36	40 N.	142	47	30 E.	17
3	do	do	41	46	10 N.	142	20	10 E.	2
4	Rain, fog	do	41	36	20 N.	142	10	00 E.	
5	Cloudy, fog	do	41	40	00 N.	141	48	10 E.	8
6	Clear, with light fog.	do	41	43	15 N.	141	37	20 E.	16
7	½ clear	do	41	42	10 N.	142	45	00 E.	8
8	Clear, heavy fog	do	41	07	8 N.	142	33	20 E.	3
9	Heavy fog, clear	do	41	01	21 N.	143	13	10 E.	24
10	Fog	do	41	16	30 N.	143	50	00 E.	
11	Rain, fog	do	41	48	20 N.	143	25	10 E.	
12	Fog	Off Yerimo	41	57	30 N.	142	00	40 E.	
13	Clear, fog	do	41	28	20 N.	143	22	15 E.	4
14	Cloudy, fog	At sea	41	43	30 N.	144	05	20 E.	
15	Heavy fog	do	42	44	50 N.	144	19	20 E.	
16	Cloudy, fog	Returning to Hakodate	42	00	00 N.	143	56	15 E.	
17	do	do	41	40	00 N.	143	26	30 E.	4
18	Clear, light fog	do	41	22	40 N.	143	09	15 E.	
19	½ clear, light fog	do	41	41	30 N.	142	05	10 E.	
20	Cloudy, fog	do	41	56	40 N.	141	40	00 E.	
21	Cloudy	do							
22		Arrived at Hakodate							
Total									510

Extract of sealing log of the Japanese schooner Third Chishima Maru, of Hakodate, for the spring season of 1894.

[Translated from Report Japanese Fish Bureau, 1894, pp. 94-102.]

Date.	Weather.	Position of vessel.	Latitude.	Longitude.	Seals.		
					Male.	Female.	Total.
1894.			° ′ ″	° ′ ″			
Feb. 2	Clear	Hakodate to Yesan					
3	Cloudy	Mororan Bay					
4	do	Off Nambu	41 09 00 N.	142 08 11 E.			
5	do	Off Shiriya	41 08 30 N.	141 54 40 E.			
6	Clear	At sea	40 32 40 N.	142 32 10 E.			
7	Cloudy	do	39 52 08 N.	142 36 08 E.			
8	Rain	do	39 10 00 N.	142 20 00 E.			
9	do	do	38 08 20 N.	142 38 20 E.			
10	do	do	38 08 20 N.	142 38 20 E.			
11	Cloudy	do	37 20 00 N.	143 03 40 E.			
12	do	do	36 16 40 N.	143 12 00 E.			
13	do	do	35 10 20 N.	143 05 10 E.			
14	½ clear	do	35 55 00 N.	142 14 00 E.			15
15	Cloudy	50 miles off Inuboye	36 12 00 N.	141 42 00 E.			
16	Clear	24 miles off Kesan	39 15 12 N.	142 30 00 E.			
17	do	24 miles at sea	38 30 00 N.	142 38 00 E.			13
18	½ clear	60 miles NE. of Kinkasan	38 22 00 N.	142 54 20 E.			
19	do	50 miles SE. of Kinkasan	38 20 00 N.	142 50 00 E.			
20	Cloudy	At sea	38 50 00 N.	142 49 50 E.			
21	Rain	60 miles SE. of Kinkasan	38 12 00 N.	142 40 00 E.			
22	Cloudy	35 miles off Imaki	37 20 00 N.	142 08 00 E.			
23	½ clear	Near Kinkasan	38 17 00 N.	142 31 00 E.			
24	Clear	To Oginohama	38 22 00 N.	142 20 00 E.			
25	do	Anchored at Oginohama	38 20 00 N.	142 23 00 E.			
26	do	do	38 22 00 N.	141 20 00 E.			
27	do	do					
28	Cloudy	do					
Mar. 1	do	do					
2	do	do					
3	Rain	do					
4	Cloudy	do					
5	do	From Kinkasan	39 40 00 N.	142 02 20 E.			
6	Clear	25 miles off Kinkasan	38 23 15 N.	142 14 00 E.	1	4	5
7	Cloudy	130 miles E. of Kinkasan	38 20 20 N.	142 35 00 E.			
8	do	180 miles off Kinkasan	38 32 00 N.	146 20 00 E.			1
9	Rain	Cruising near shore	38 57 00 N.	141 52 00 E.			
10	Cloudy	150 miles off Inuboye	38 00 20 N.	142 40 00 E.			3
11	do	At sea	37 27 00 N.	142 50 40 E.			
12	Clear	do	36 20 00 N.	143 20 00 E.			
13	do	180 miles NE. of Inuboye	36 10 00 N.	142 12 00 E.			
14	do	At sea	36 00 00 N.	143 00 00 E.			
15	do	do	35 39 00 N.	142 12 00 E.			
16	Cloudy	do	36 12 00 N.	142 08 00 E.			
17	do	70 miles SSE. of Kinkasan	37 52 00 N.	142 02 00 E.			
18	do	90 miles E. of Kinkasan	38 21 00 N.	143 09 00 E.			
19	Rain	At sea	37 53 00 N.	142 40 00 E.			
20	Cloudy	do	38 48 00 N.	141 59 00 E.			
21	Clear	do	38 03 00 N.	143 12 00 E.	2	23	25
22	do	do	38 05 00 N.	143 45 00 E.			1
23	do	do	37 21 00 N.	143 15 00 E.			
24	Cloudy	40 miles NE. of Ryori	37 50 00 N.	142 23 00 E.			5
25	Rain and heavy fog.	do	39 45 00 N.	142 40 00 E.			
26	Cloudy, heavy fog.	Near Miyako	39 40 00 N.	142 15 00 E.			
27	do	Anchored at Miyako	39 38 00 N.	142 12 00 E.			
28		do	39 38 00 N.	142 12 00 E.			
29		do	39 38 00 N.	142 12 00 E.			
30		do	39 38 00 N.	142 12 00 E.			
31	Cloudy	To Kamaishi	38 38 00 N.	142 12 00 E.			
Apr. 1	Clear	Off Kamaishi	38 56 00 N.	142 50 00 E.			
2	do	At sea	37 57 00 N.	143 18 00 E.			
3	do	do	38 21 00 N.	144 30 00 E.			2
4	do	do	37 17 00 N.	144 23 00 E.			
5	Cloudy	do	37 35 00 N.	142 45 00 E.			
6	Clear	do	38 35 00 N.	142 32 00 E.			1
7	do	do	38 46 00 N.	142 30 00 E.			1
8	Cloudy	do	38 24 00 N.	141 54 00 E.			
9	Rain	Off Kinkasan	38 24 00 N.	141 54 00 E.			
10	do	Off Kisen					
11	Cloudy	At sea	39 20 00 N.	142 28 00 E.			
12	do	At Miyako	39 22 00 N.	142 23 00 E.			
13		At Miyako, staying until April 25.					

***Extract of sealing log of the Japanese schooner Third Chishima Maru, of Hakodate, for the spring season of 1894.*—Continued.**

[Translated from Report Japanese Fish Bureau, 1894, pp. 94-102.]

Date.	Weather.	Position of vessel.	Latitude.	Longitude.	Seals.		
					Male.	Female.	Total.
1894.			° ′ ″	° ′ ″			
Apr. 25	Clear		39 38 00 N.	142 12 00 E.			
26	Cloudy	Anchored at Miyako	39 38 00 N.	142 12 00 E.			
27	Rain	do	39 38 00 N.	142 12 00 E.			
28	do	do	39 38 00 N.	142 12 00 E.			
29	Cloudy	do	39 38 00 N.	142 14 00 E.			
30	do	Sailing near shore	39 30 00 N.	142 10 00 E.			
May 1	Cloudy, fog	8 miles off Miyako	39 30 00 N.	142 10 00 E.			1
2	Clear	At sea	39 46 00 N.	142 12 00 E.			4
3	½ clear	do	41 45 00 N.	141 50 00 E.			1
4	Rain	do	40 50 00 N.	142 28 00 E.			
5	Clear	do	41 15 00 N.	142 30 00 E.			
6	do	do	41 05 00 N.	142 15 00 E.			
7	½ clear, fog	Off Kuji	40 07 00 N.	142 02 00 E.	3	12	15
8	Clear, fog	At sea	40 33 00 N.	142 21 00 E.			1
9	do	do	41 40 00 N.	141 55 00 E.			
10	Clear	do	41 45 00 N.	141 50 00 E.			6
11	Clear, fog	20 miles off Shiriya	41 27 00 N.	141 53 00 E.			1
12	Cloudy, fog	At sea	41 27 00 N.	141 57 00 E.			21
13	Rain	Off Shiriya		141 37 00 E.			3
14	Clear	do	41 05 00 N.	141 40 00 E.	2	28	30
15	Rain	do	41 22 00 N.	142 00 00 E.			
16	½ clear, fog	At sea	41 45 00 N.	141 50 00 E.			4
17	Clear	do	41 20 00 N.	141 35 00 E.			5
18	do	do	41 35 00 N.	142 21 00 E.			
19	Clear, fog	do	41 30 00 N.	142 34 00 E.			
20	½ clear, fog	do	41 30 00 N.	142 35 00 E.			5
21	Clear, fog	Off Yerimo	41 30 00 N.	143 08 00 E.			12
22	Cloudy	do	41 41 00 N.	143 07 00 E.			
23	½ clear	At sea	41 40 00 N.	143 00 00 E.			
24	Clear	do	41 52 00 N.	143 12 00 E.	4	18	22
25	½ clear	do	41 52 00 N.	143 10 00 E.			
26	Clear	Off Horoidsumi					
27	Rain	Off Yerimo	41 50 00 N.	143 12 00 E.			
28	Cloudy	do	41 51 00 N.	143 05 00 E.			1
29	½ clear	do	42 04 00 N.	143 45 00 E.	3	13	16
30	do	At sea	42 40 00 N.	143 40 00 E.			7
31	do	Off Akishi	42 52 00 N.	144 33 00 E.	7	14	21
June 1	Cloudy	do	42 52 00 N.	144 23 00 E.			12
2	½ clear	do	42 48 00 N.	144 26 00 E.	4		4
3	Clear	Off Kombumori	42 58 00 N.	144 32 00 E.			
4	Rain	From Kombumori	42 54 00 N.	144 34 00 E.			
5	Clear	Off Kombumori	42 52 00 N.	144 32 00 E.			1
6	do	Off Akishi	42 45 00 N.	144 42 00 E.			3
7	do	do	42 55 00 N.	144 50 00 E.	1		1
8	do	Anchored at Akishi	42 55 00 N.	144 50 00 E.			
9	do	Off Daikokushima	42 52 00 N.	144 50 00 E.			1
10	½ clear	Off Kusiro	42 34 00 N.	144 18 00 E.	3	2	5
11	Cloudy, rain	Off Yerimo	42 00 00 N.	143 20 00 E.			
12	Cloudy	At sea	41 48 00 N.	143 00 00 E.			
13	Clear	do	41 45 00 N.	142 35 00 E.	3		3
14	do	30 miles off Yesan	42 05 00 N.	141 55 00 E.	1		1
15	Rain	Off Hakuro	42 28 00 N.	141 33 00 E.			
16	½ clear	Off Mororan	42 15 00 N.	141 18 00 E.			
17	Cloudy	Off Tannai	42 15 00 N.	141 18 00 E.			
18	Clear	Off Yesan	41 50 00 N.	141 17 00 E.			
19	Cloudy	do	41 35 00 N.	141 12 00 E.			
20	½ clear	Strait of Tsugaru	41 48 00 N.	141 18 00 E.			
21	Clear, fog	Return to Hakodate	41 46 00 N.	140 54 00 E.			
22	do	do					
Total							279

Extract of sealing log of the American schooner Louis Olsen, Guillams, master, for the spring season of 1894.

[From Townsend's report.]

Date.	Latitude.	Longitude.	Seals.
1894.	° ′	° ′	
Mar. 12	36 26 N.	145 23 E.	1
13	36 17 N.	145 43 E.	7
15	36 23 N.	147 41 E.	67
17	38 36 N.	147 52 E.	14
19	37 40 N.	146 15 E.	42
21	37 47 N.	144 22 E.	6
Apr. 1	38 16 N.	146 46 E.	54
2	38 22 N.	147 39 E.	50
3	39 20 N.	146 05 E.	15
4	38 59 N.	146 46 E.	8
5	38 34 N.	145 47 E.	39
6	38 20 N.	145 50 E.	30
8	38 08 N.	144 52 E.	24
12	40 13 N.	144 18 E.	10
18	37 06 N.	145 56 E.	5
19	37 02 N.	146 03 E.	53
20	37 30 N.	146 20 E.	28
22	37 08 N.	146 39 E.	8
23	37 18 N.	146 03 E.	33
26	36 15 N.	146 26 E.	60
28	36 41 N.	146 09 E.	8
29	37 14 N.	146 15 E.	5
30	37 01 N.	146 05 E.	29
May 1	35 54 N.	144 43 E.	36
16	40 55 N.	142 58 E.	3
17	41 45 N.	143 35 E.	35
19	41 37 N.	143 03 E.	65
20	41 57 N.	142 27 E.	19
21 *a*			50
24	41 00 N.	143 00 E.	30
25	41 47 N.	142 28 E.	3
28	42 38 N.	*b* 142 54 E.	7
30	42 42 N.	144 58 E.	15
31	42 38 N.	144 38 E.	63
June 1	42 46 N.	145 03 E.	35
2	42 38 N.	143 57 E.	10
3	42 37 N.	144 06 E.	5
4	42 22 N.	144 30 E.	10
5	42 52 N.	144 53 E.	3
6	42 59 N	144 57 E.	12
7	42 55 N.	145 28 E.	12
8	42 42 N.	145 56 E.	11
9	42 37 N.	145 59 E.	33
10	42 56 N.	146 08 E.	2
Total			1,055

a C. Yerimo SE. by E. 28 miles.

b 144° 11′ L. S.

Extract of sealing log of the American schooner Allie I. Algar, Wester, master, for the spring season of 1894.

[From Townsend's report.]

Date.	Latitude.	Longitude.	Seals.
1894.	° ′	° ′	
Mar. 23	39 22 N.	144 23 E.	8
24	39 45 N.	142 23 E.	37
26	40 00 N.	144 00 E.	23
29	39 12 N.	143 13 E.	2
31	40 00 N.	144 00 E.	36
Apr. 1	39 54 N.	144 17 E.	17
3	39 15 N.	144 06 E.	78
4	39 25 N.	144 24 E.	32
6	39 28 N.	143 31 E.	16
8	39 25 N.	143 10 E.	47
18	39 29 N.	142 54 E.	38
23	39 27 N.	142 21 E.	10
24	39 51 N.	142 00 E.	3
25	40 15 N.	142 23 E.	29
26	40 13 N.	143 00 E.	40
27 *a*			2
30	40 03 N.	143 06 E.	26
May 2 *a*			45
3 *a*			11
7	41 39 N.	142 05 E.	47
11	41 36 N.	143 20 E.	25
12	41 57 N.	143 08 E.	17
13	42 05 N.	142 38 E.	28
14	41 35 N.	142 40 E.	31
21	42 50 N.	143 50 E.	6
24	42 35 N.	144 56 E.	50
25 *a*			8
26 *a*			30
29 *a*			7
June 1 *a*			34
6	43 16 N.	147 00 E.	12
7 *a*			34
8 *a*			32
9 *b*			102
10 *b*			22
12 *b*			67
18 *b*			20
19 *b*			19
Total			1,091

a No position.

b Ten miles off Skotan.

Extract of sealing log of the British schooner Umbrina, Campbell, master, for the spring season of 1894.

[From Townsend's report.]

Date.	Latitude.	Longitude.	Seals.
1894.	° ′	° ′	
Mar. 17	37 20 N.	145 04 E.	17
18	37 13 N.	143 04 E.	5
19	37 30 N.	144 37 E.	1
21	37 05 N.	146 40 E.	90
22	37 12 N.	146 20 E.	11
23	37 16 N.	146 27 E.	67
24	37 10 N.	145 15 E.	90
25	37 20 N.	145 35 E.	60
26	37 40 N.	146 19 E.	56
Apr. 1	37 40 N.	446 07 E.	79
2	37 25 N.	146 00 E.	135
3	37 15 N.	145 38 E.	88
4	37 20 N.	142 20 E.	48
5	37 10 N.		
6	37 20 N.	145 40 E.	42
7	37 17 N.	145 26 E.	103
8	37 35 N.	145 33 E.	41
11	37 24 N.	145 40 E.	18
12	37 27 N.	146 05 E.	57
13	37 20 N.	146 00 E.	74
16	37 30 N.	146 08 E.	23
17	37 12 N.	145 50 E.	1
18	37 14 N.	145 45 E.	15
19	37 19 N.	146 00 E.	91
20	37 16 N.	146 03 E.	33
22	36 55 N.	145 50 E.	58
23	37 06 N.	145 45 E.	33
26	36 40 N.	146 25 E.	84
27	36 48 N.	146 00 E.	14
28*a*	36 50 N.		1
29	37 34 N.	146 23 E.	19
30	37 35 N.	145 55 E.	16
May 1	36 56 N.	145 55 E.	70
3	36 40 N.	145 47 E.	19
12	37 40 N.	146 50 E.	104
14	37 49 N.	146 58 E.	21
15	37 51 N.	147 28 E.	119
18	37 16 N.	145 00 E.	1
21	38 11 N.	146 35 E.	61
22	38 22 N.	146 25 E.	51
23	38 37 N.	146 10 E.	57
24	38 36 N.	146 20 E.	9
26	40 11 N.	144 46 E.	27
28	41 50 N.	144 12 E.	7
29	41 35 N.	145 00 E.	2
31	43 03 N.	147 30 E.	6
June 5	41 23 N.	145 40 E.	5
6	40 55 N.	145 56 E.	92
7	29 N.	146 10 E.	11
8	40 37 N.	146 02 E.	31
9	40 45 N.	145 50 E.	79
10	40 46 N.	145 52 E.	55
12	40 30 N.	145 41 E.	36
13	40 40 N.	146 00 E.	
14	41 09 N.	145 37 E.	4
15	41 02 N.	145 55 E.	8
16	40 00 N.	145 55 E.	1
17	41 57 N.	146 08 E.	15
18	43 10 N.	147 12 E.	2
19	43 41 N.	147 30 E.	81
21	43 45 N.	147 05 E.	9
22	43 40 N.	147 10 E.	11
Total			2,464

a No observations.

Extract of sealing log of the American schooner Edward E. Webster, McLean, master, for the spring season of 1894.

[From Townsend's report.]

Date.	Latitude.	Longitude.	Seals.
1894.	° ′	° ′	
Jan. 29	37 46 N.	146 15 E.	29
Feb. 2	38 00 N.	144 40 E.	30
5	36 35 N.	145 00 E.	17
17	38 30 N.	146 00 E.	61
24	36 30 N.	145 46 E.	27
Mar. 5	37 32 N.	144 35 E.	25
15	38 01 N.	146 16 E.	31
19	38 10 N.	145 30 E.	36
21	38 00 N.	146 10 E.	47
23	37 20 N.	145 27 E.	65
24	37 20 N.	145 30 E.	57
26	38 31 N.	146 18 E.	28
Apr. 1	37 11 N.	145 21 E.	61
2	37 07 N.	145 35 E.	58
3	37 02 N.	145 25 E.	40
4	37 06 N.	145 20 E.	17
5	36 56 N.	145 40 E.	29
8	37 15 N.	146 10 E.	33
10	38 00 N.	146 03 E.	26
11	39 10 N.	145 51 E.	47
12	39 10 N.	145 51 E.	73
16	40 00 N.	144 20 E.	27
18	37 40 N.	145 25 E.	17
19	37 40 N.	145 07 E.	128
22	36 57 N.	145 00 E.	84
26	36 44 N.	144 33 E.	101
May 23	40 00 N.	144 00 E.	17
24	40 10 N.	144 08 E.	21
30	39 52 N.	143 30 E.	41
June 1	41 04 N.	142 20 E.	29
3	41 42 N.	142 30 E.	24
6[a]	....	....	38
8	41 14 N.	143 18 E.	18
10	41 10 N.	143 15 E.	22
13	41 24 N.	142 36 E.	24
Total	....	....	1,428

[a] C. Yerimo E. 25 miles.

Extract of sealing log of the British schooner Beatrice, August G. Bjerre, master, for the spring season of 1893.

[From Venning's report.]

Date.	Latitude.	Longitude.	Seals.
1893.	° ′	° ′	
Mar. 21	37 11 N.	142 34 E.	8
22	37 27 N.	142 33 E.	9
23	37 23 N.	142 29 E.	46
20	38 18 N.	142 30 E.	15
31	38 34 N.	143 23 E.	27
Apr. 1	38 44 N.	143 33 E.	73
2	38 43 N.	143 08 E.	8
5	39 18 N.	148 51 E.	1
6	39 18 N.	143 50 E.	60
7	39 07 N.	143 33 E.	38
9	39 40 N.	143 23 E.	75
10	39 43 N.	144 23 E.	24
12	39 45 N.	144 00 E.	45
13	39 39 N.	144 23 E.	23
14	39 30 N.	144 20 E.	13
15	40 20 N.	143 53 E.	18
16	40 16 N.	143 44 E.	1
17	40 16 N.	143 39 E.	1
18	40 37 N.	143 10 E.	13
19	40 40 N.	143 43 E.	54
21	40 54 N.	143 53 E.	13
24	41 42 N.	145 27 E.	7
28	40 03 N.	144 25 E.	43
29	39 37 N.	143 34 E.	51
May 1	30 48 N.	143 57 E.	75
2	39 41 N.	143 46 E.	21
3	40 28 N.	142 56 E.	6
6	40 28 N.	142 50 E.	16
12	40 27 N.	143 11 E.	12
14	41 16 N.	142 47 E.	61
15	40 50 N.	143 40 E.	68
16	41 25 N.	142 24 E.	25
17	41 24 N.	142 54 E.	47
18	41 32 N.	142 43 E.	25
19	41 46 N.	143 43 E.	14
23	41 34 N.	143 06 E.	44
24	41 30 N.	143 00 E.	58
25	41 40 N.	143 30 E.	10
26	41 30 N.	143 16 E.	1
30	....	....	1
June 2	41 31 N.	144 14 E.	1
6	43 05 N.	146 42 E.	13
7	42 50 N.	145 55 E.	68
8	42 39 N.	145 30 E.	14
9	42 55 N.	145 35 E.	27
10	42 42 N.	144 53 E.	6
11	43 09 N.	146 57 E.	9
13	42 53 N.	146 24 E.	1
15	42 32 N.	145 30 E.	28
16	42 32 N.	145 14 E.	10
17	42 33 N.	145 33 E.	3
18	42 02 N.	144 36 E.	4
21[a]	41 41 N.	142 18 E.	18
July 11	41 27 N.	145 14 E.	1
18	43 59 N.	148 14 E.	1
Total	....	....	1,354

[a] June 24 to July 8 in Hakodate.

Extract of sealing log of the British schooner Casco, Otto Bucholz, master, for the spring season of 1893.

[From Venning's report.]

Date.	Latitude.	Longitude.	Seals.
1893.	° ′	° ′	
Apr. 24	40 31 N.	143 42 E.	17
27	40 18 N.	144 21 E.	8
28	40 38 N.	143 31 E.	27
29	40 35 N.	143 19 E.	20
30	40 17 N.	142 33 E.	37
May 1	40 02 N.	142 42 E.	70
2	40 02 N.	142 34 E.	38
3	40 26 N.	142 38 E.	12
5	40 27 N.	142 58 E.	8
6	40 09 N.	142 48 E.	62
7	40 06 N.	142 43 E.	92
8	40 09 N.	142 42 E.	34
9	40 44 N.	143 04 E.	46
10	40 47 N.	142 27 E.	49
11	40 35 N.	142 39 E.	5
12	40 28 N.	142 22 E.	10
13	39 59 N.	142 51 E.	59
14	39 45 N.	143 03 E.	44
15	39 50 N.	143 02 E.	15
16	39 40 N.	143 00 E.	60
17	39 35 N.	143 35 E.	47
18	39 30 N.	143 16 E.	13
19	39 51 N.	143 40 E.	14
23	40 40 N.	142 45 E.	41
24	40 55 N.	142 47 E.	142
25	40 48 N.	142 33 E.	61
26	41 21 N.	142 45 E.	25
29	41 26 N.	142 52 E.	18
31[a]	....	....	....
June 2[b]	....	....	....
4	41 33 N.	142 39 E.	58
5	41 52 N.	142 39 E.	4
6	41 30 N.	142 59 E.	4
7	41 36 N.	143 34 E.	56
8	41 37 N.	143 54 E.	36
9	41 31 N.	143 55 E.	20
11	42 47 N.	144 48 E.	25
14	43 06 N.	146 50 E.	3
15	42 49 N.	146 20 E.	63
16	42 48 N.	146 10 E.	29
20	43 25 N.	146 28 E.	4
21	43 25 N.	146 28 E.	20
Total	....	....	1,396

[a] Went into Hakodate.

[b] Left Hakodate.

Extract of sealing log of the British schooner Arietis, Abel Douglas, master, for the spring season of 1893.

[From Venning's report.

Date.	Latitude.	Longitude.	Seals.
1893.	° ′	° ′	
Apr. 3	37 35 N.	144 33 E.	26
9	37 28 N.	143 50 E.	175
10	36 35 N.	144 10 E.	3
12	37 35 N.	144 55 E.	149
May 25	39 48 N.	143 23 E.	76
June 2	41 29 N.	143 02 E.	92
3	41 17 N.	143 13 E.	40
4	41 30 N.	143 18 E.	12
6	41 04 N.	143 56 E.	8
7	41 17 N.	144 04 E.	25
8	42 02 N.	144 08 E.	65
9	42 56 N.	144 09 E.	30
10	42 53 N.	144 27 E.	18
11	43 00 N.	145 27 E.	45
15	43 35 N.	147 10 E.	11
16	43 45 N.	147 20 E.	41
19	43 25 N.	147 10 E.	19
20	43 20 N.	147 10 E.	11
21	43 26 N.	147 00 E.	11
22	43 28 N.	147 00 E.	5
23	43 33 N.	146 59 E.	4
24	44 07 N.	147 30 E.	33
28	45 40 N.	151 00 E.	2
29	46 30 N.	152 20 E.	5
July 1	47 32 N.	153 05 E.	2
Total	....	....	908

Extract of sealing log of the British schooner Carlotta G. Cox, William Byers, master, for the spring season of 1893.

[From Venning's report.]

Date.	Latitude.	Longitude.	Seals.
1893.	° ′	° ′	
Mar. 28	39 22 N.	145 00 E.	74
31	39 05 N.	144 46 E.	4
Apr. 1	39 17 N.	144 46 E.	37
2	39 25 N.	145 19 E.	95
6	40 11 N.	145 08 E.	64
7	40 28 N.	145 28 E.	9
9	39 45 N.	145 07 E.	168
10	39 45 N.	145 05 E.	111
11	39 50 N.	145 10 E.	13
12	40 03 N.	145 13 E.	1
13	40 13 N.	145 26 E.	43
14	40 10 N.	145 05 E.	104
15	40 09 N.	144 15 E.	38
16	40 30 N.	144 23 E.	9
17	39 23 N.	145 07 E.	8
18	40 34 N.	144 38 E.	2
19	40 53 N.	145 28 E.	13
21	40 07 N.	145 50 E.	27
23	39 59 N.	145 24 E.	7
24	39 37 N.	145 08 E.	103
27	40 04 N.	145 10 E.	33
28	39 43 N.	145 39 E.	155
29	39 26 N.	145 47 E.	67
30	39 23 N.	146 26 E.	23
May 3	39 36 N.	145 06 E.	15
6	39 32 N.	145 32 E.	7
7	40 22 N.	145 32 E.	15
8	40 15 N.	146 10 E.	33
9	40 18 N.	145 38 E.	39
10	40 36 N.	145 12 E.	17
11	40 05 N.	145 10 E.	48
12	40 11 N.	145 13 E.	28
13	40 37 N.	145 20 E.	1
14	40 11 N.	145 32 E.	61
15	40 39 N.	145 27 E.	10
16	40 46 N.	145 21 E.	34
17	40 53 N.	146 04 E.	17
18	40 52 N.	145 49 E.	84
19	40 53 N.	145 51 E.	33
20	40 54 N.	145 46 E.	39
23	40 11 N.	144 59 E.	38
24	40 02 N.	145 01 E.	82
25	39 44 N.	145 01 E.	54
29	......	......	13
30	40 22 N.	145 12 E.	11
June 7*a*	41 46 N.	142 21 E.	23
8*a*	......	......	107
9*a*	41 50 N.	143 55 E.	28
10	42 35 N.	144 45 E.	17
11	43 15 N.	146 00 E.	28
12	43 22 N.	145 37 E.	14
14	42 55 N.	146 28 E.	6
15	43 10 N.	146 30 E.	36
16	......	......	33
17	43 30 N.	146 20 E.	3
18	......	......	3
19	43 01 N.	145 42 E.	41
20	43 46 N.	145 45 E.	1
21	43 45 N.	145 50 E.	46
22	42 50 N.	144 58 E.	46
23	42 55 N.	144 50 E.	10
27	43 09 N.	146 22 E.	17
28	43 11 N.	146 32 E.	33
29*b*	43 20 N.	146 42 E.	6
30	43 00 N.	146 30 E.	9
Total	......	......	2,394

a Between June 7 and 9 went into Hakodate for water.
b Abreast of Akishi (Bay (?) (?)—L. S.).

Extract of sealing log of the British schooner Geneva, William O'Leary, master, for the spring season of 1893.

[From Venning's report.]

Date.		Latitude.	Longitude.	Seals
1893.		° ′	° ′	
Apr.	1	38 15 N.	143 12 E.	58
	2	39 07 N.	143 32 E.	49
	7	39 31 N.	143 50 E.	51
	9	39 40 N.	144 08 E.	94
	10	39 48 N.	144 07 E.	70
	13	40 39 N.	143 50 E.	12
	14	40 38 N.	143 46 E.	71
	15	40 25 N.	143 12 E.	6
	16	40 42 N.	144 03 E.	5
	19	41 01 N.	144 12 E.	15
	21	41 37 N.	144 39 E.	15
	24	41 53 N.	145 00 E.	15
	28	41 39 N.	145 02 E.	16
	29	41 24 N.	144 49 E.	37
May	1	40 13 N.	142 52 E.	91
	2	39 54 N.	142 48 E.	69
	6	39 35 N.	143 02 E.	25
	7	39 42 N.	142 50 E.	57
	8	39 49 N.	142 27 E.	42
	9	39 51 N.	142 54 E.	16
	11	40 07 N.	143 25 E.	10
	14	41 43 N.	142 03 E.	14
	15	41 36 N.	142 01 E.	62
	16	41 17 N.	142 15 E.	22
	17	41 27 N.	142 15 E.	57
	18	41 19 N.	142 38 E.	49
	19	41 24 N.	142 35 E.	20
	20	41 50 N.	143 17 E.	6
	23	41 24 N.	142 32 E.	33
	24	41 31 N.	142 19 E.	19
	26	41 23 N.	143 25 E.	46
June	6[a]	42 57 N.	145 56 E.	32
	7	42 57 N.	145 43 E.	47
	8	42 58 N.	146 10 E.	42
	9	42 56 N.	144 37 E.	58
	10	43 12 N.	145 55 E.	50
	11	43 19 N.	146 52 E.	35
	15	42 54 N.	146 12 E.	37
	16	42 30 N.	146 01 E.	9
	19	42 25 N.	145 49 E.	23
	22–28[b]			
	29	43 19 N.	146 01 E.	17
	30	43 21 N.	146 47 E.	19
July	1	43 11 N.	146 53 E.	6
	4	42 13 N.	153 36 E.	7
	7	43 00 N.	155 58 E.	40.
Total				1,574

[a] Bad weather; no sealing.
[b] At Akishi for water.

Extract of sealing log of the British schooner W. P. Hall, J. B. Brown, master, for the spring season of 1893.

[From Venning's report.]

Date.		Latitude.	Longitude.	Seals.
1893.		° ′	° ′	
Apr.	7	36 38 N.	144 07 E.	5
	12	36 42 N.	143 34 E.	9
	15	36 47 N.	143 01 E.	4
	21	39 14 N.	145 38 E.	56
	24	39 19 N.	146 17 E.	8
	28	30 09 N.	147 03 E.	9
	29	39 20 N.	145 58 E.	30
	30	39 25 N.	145 39 E.	3
May	9	39 18 N.	145 41 E.	12
	10	39 48 N.	146 12 E.	19
	11	39 11 N.	145 36 E.	10
	12	39 38 N.	145 49 E.	16
	13	39 31 N.	146 11 E.	7
	14	39 28 N.	146 05 E.	41
	17	39 58 N.	146 09 E.	48
	18	39 40 N.	145 48 E.	65
	20	39 32 N.	144 57 E.	20
	23	40 17 N.	146 20 E.	6
	24	39 57 N.	146 05 E.	29
	25	39 46 N.	145 00 E.	4
	26	39 50 N.	145 27 E.	11
	29	30 16 N.	144 58 E.	1
	30	38 49 N.	146 36 E.	19
June	1	39 38 N.	146 40 E.	4
	2	39 54 N.	146 57 E.	27
	3	39 47 N.	146 52 E.	32
	4	39 39 N.	146 33 E.	4
	5	39 38 N.	146 01 E.	15
	7	40 45 N.	146 10 E.	11
	8	41 22 N.	145 21 E.	12
	9	41 30 N.	145 53 E.	27
	10	42 23 N.	147 05 E.	18
	11	43 05 N.	145 45 E.	7
	15	42 30 N.	145 20 E.	12
	16	42 25 N.	146 05 E.	6
	18	42 33 N.	145 05 E.	12
	19	42 30 N.	144 45 E.	12
	23	42 24 N.	145 35 E.	5
	25 *a*			
	27 *b*			
	28	42 53 N.	145 18 E.	15
	29	42 53 N.	145 18 E.	8
Total				659

a Left Akishi.
b Went into Akishi Bay for water.

Extract of sealing log of the British schooner Mermaid, W. H. Whitely, master, for the spring season of 1893.

[From Venning's report.]

Date.		Latitude.	Longitude.	Seals.
1893.		° ′	° ′	
Mar.	25	36 10 N.	145 00 E.	55
Apr.	1 [a]			
	5 [b]			
	10	38 00 N.	145 00 E.	53
	11 [c]			
	12	36 40 N.	145 43 E.	31
May	8	38 30 N.	144 47 E.	4
	10	Foggy.		37
	11	Foggy.		8
	12	Foggy.		26
	13	Foggy.		17
	14	38 21 N.	146 00 E.	58
	15	38 37 N.	145 00 E.	1
	16	39 30 N.	144 10 E.	29
	17	39 50 N.	144 00 E.	18
	18	Thick fog.		57
	20	40 10 N.	145 06 E.	18
	22			2
	23	Foggy.		11
	24	Foggy.		43
	25	39 57 N.	144 16 E.	82
	26			9
	29	40 08 N.	144 20 E.	2
June	2	40 40 N.	144 00 E.	54
	3	40 30 N.	143 00 E.	49
	4	41 00 N.	143 27 E.	70
	6	41 11 N.	143 50 E.	20
	7	40 45 N.	143 49 E.	51
	8	40 26 N.	143 49 E.	21
	9	40 22 N.	144 00 E.	26
	11	41 50 N.	143 20 E.	26
	15	Foggy.		23
	16	Foggy.		8
	19	Foggy.		17
Total				926

[a] Went into Yokohama.

[b] Left Yokohama.

[c] Ran into a whale, vessel receiving severe damage. Went to Yokohama for repairs, and remained there till May 4.

Extract of sealing log of the British schooner Agnes Macdonald, Melville Cutler, master, for the spring season of 1893.

[From Venning's report.]

Date.	Latitude.	Longitude.	Seals.
1893.	° ′	° ′	
Apr. 2	38 52 N.	142 42 E.	41
6	40 40 N.	143 30 E.	71
7	40 54 N.	143 23 E.	28
8	41 47 N.	143 40 E.	......
9	39 55 N.	143 26 E.	103
10	39 55 N.	143 20 E.	30
11	30 50 N.	143 30 E.	27
12	39 17 N.	143 37 E.	135
13	39 16 N.	143 50 E.	18
14	39 13 N.	144 02 E.	144
15	39 31 N.	144 05 E.	57
16	39 28 N.	144 00 E.	29
18	39 18 N.	144 10 E.	81
19	39 35 N.	144 10 E.	12
20	40 05 N.	144 56 E.	36
28	39 54 N.	145 00 E.	104
29	39 54 N.	144 40 E.	60
30	39 54 N.	144 50 E.	4
May 1	39 54 N.	144 06 E.	6
2	39 54 N.	144 00 E.	13
6	40 25 N.	143 23 E.	4
7	40 53 N.	144 01 E.	2
8	40 55 N.	144 25 E.	27
9	40 46 N.	144 54 E.	14
10	41 20 N.	145 00 E.	16
13	40 02 N.	144 40 E.	7
14	40 07 N.	144 22 E.	93
15	40 08 N.	144 42 E.	8
16	40 08 N.	144 42 E.	44
17	40 06 N.	144 42 E.	102
18	40 14 N.	144 50 E.	106
19	40 35 N.	144 56 E.	35
20	40 41 N.	144 49 E.	76
23	40 13 N.	144 49 E.	89
24	40 13 N.	144 20 E.	36
25	40 52 N.	145 06 E.	28
26	40 52 N.	145 06 E.	12
June 2	41 29 N.	145 25 E.	11
3	42 12 N.	145 45 E.	7
5	42 22 N.	146 20 E.	41
6	41 21 N.	145 30 E.	104
7	41 30 N.	145 30 E.	39
8	41 13 N.	145 48 E.	40
9	41 00 N.	145 38 F.	97
10	40 45 N.	144 40 E.	3
11	40 02 N.	144 18 E.	16
12	41 28 N.	145 18 E.	8
15	43 08 N.	147 03 E.	59
16	43 15 N.	147 00 E.	95
17	43 20 N.	146 50 E.	6
18	43 24 N.	146 50 E.	12
19	43 21 N.	146 50 E.	19
21	43 14 N.	146 30 E.	39
22	43 04 N.	146 30 E.	35
23	43 04 N.	146 30 E.	9
Total	......	......	2,338

Extract of sealing log of the British schooner Vera, William Shields, master, for the spring season of 1893.

[From Venning's report.]

Date.		Latitude.	Longitude.	Seals.
1893.		° ′	° ′	
Mar.	29	34 46 N.	140 03 E.	4
	31	38 46 N.	144 23 E.	4
Apr.	1	38 26 N.	143 26 E.	44
	2	38 14 N.	142 35 E.	9
	4	Foggy.	....	45
	5	38 04 N.	142 52 E.	19
	6	38 35 N.	143 15 E.	41
	7	Foggy.	....	33
	10	38 18 N.	143 13 E.	22
	12	41 16 N.	143 23 E.	2
	13	41 30 N.	143 54 E.	9
	18	41 09 N.	144 22 E.	50
	20	40 21 N.	143 38 E.	10
	21	Foggy.	....	59
	24	40 29 N.	143 30 E.	17
	28	Foggy.	....	87
	29	Foggy.	....	101
May	1	40 40 N.	143 59 E.	11
	2	40 27 N.	143 54 E.	19
	3	40 21 N.	143 59 E.	8
	6	Foggy.	....	12
	7	Foggy.	....	20
	8	40 23 N.	144 57 E.	34
	9	40 17 N.	144 20 E.	28
	10	....	....	15
	14	41 08 N.	144 29 E.	47
	15	Foggy.	....	20
	16	Foggy.	....	51
	17	Foggy.	....	48
	18	Foggy.	....	22
	19	Foggy.	....	61
	20	Foggy.	....	59
	23	Foggy.	....	42
	24	Foggy.	....	16
	25	41 22 N.	144 09 E.	5
	26	....	....	60
	30	....	....	26
June	3 *a*	....	....	3
	4 *a*	....	....	7
	6 *a*	....	....	9
	7 *a*	....	....	83
	8 *a*	....	....	20
	9 *a*	....	....	24
	10 *a*	....	....	25
	12 *a*	....	....	28
	19	....	....	42
	20	....	....	49
	23	....	....	11
	27	....	....	44
	28	44 17 N.	148 09 E.	15
	29	....	....	63
July	1	....	....	25
	2	44 03 N.	147 55 E.	0
	3	....	....	46
	6	44 53 N.	148 18 E.	106
	7	....	....	83
	9	44 47 N.	148 17 E.	16
	10	....	....	40
	12	....	....	12
	14	....	....	2
Total		....	....	1,912

a Along the coast between 39° and 41° north latitude and 144° and 146° east longitude, observation average 45 miles offshore.

Extract of sealing log of the British Schooner Sadie Turpel, Charles Leblanc, master, for the spring season of 1893.

[From Venning's report.]

Date.	Latitude.		Longitude.		Seals.
1893.	°	′	°	′	
Apr. 19	39	22 N.	143	12 E.	18
20	39	35 N.	143	44 E.	80
21	39	45 N.	143	49 E.	12
23	39	49 N.	144	12 E.	11
24	40	05 N.	144	07 E.	47
27	39	40 N.	144	10 E.	5
30	39	52 N.	142	40 E.	2
May 1	39	50 N.	142	50 E.	75
2	40	00 N.	142	50 E.	54
3	40	00 N.	142	55 E.	3
6	39	28 N.	142	33 E.	41
7	39	25 N.	142	33 E.	3
8	39	30 N.	142	55 E.	18
9	40	00 N.	142	58 E.	6
12	40	47 N.	142	45 E.	36
13	40	26 N.	142	51 E.	7
14	40	02 N.	143	00 E.	41
17	40	14 N.	143	15 E.	45
18	40	30 N.	143	16 E.	46
19	40	08 N.	143	08 E.	50
20	40	07 N.	143	19 E.	25
23	40	55 N.	142	33 E.	14
24	40	51 N.	142	30 E.	8
25	40	58 N.	142	46 E.	37
29	40	27 N.	143	26 E.	27
June 2	42	30 N.	146	00 E.	2
3	42	55 N.	146	05 E.	13
4	42	52 N.	145	44 E.	2
6	42	01 N.	145	11 E.	6
7	41	14 N.	142	35 E.	25
9	41	13 N.	142	36 E.	34
17	42	15 N.	141	40 E.	9
18	42	03 N.	142	00 E.	15
19	41	37 N.	143	08 E.	16
22	42	35 N.	144	50 E.	23
23	42	40 N.	145	02 E.	22
27	44	52 N.	148	30 E.	24
28	44	50 N.	148	50 E.	12
29	44	56 N.	149	15 E.	54
July 2	44	56 N.	149	15 E.	3
4	44	58 N.	149	25 E.	1
16	48	22 N.	158	15 E.	1
Total					973

Extract of sealing log of the British schooner Umbrina, Campbell, master, for the spring season of 1893.

[From Townsend's report.]

Date.	Latitude.	Longitude.	Seals.
1893.	° ′	° ′	
Apr. 19	38 00 N.	143 00 E.	......
20	38 30 N.	143 00 E.	91
22	39 30 N.	143 15 E.	......
24	39 40 N.	144 22 E.	3
27	38 30 N.	145 55 E.	31
28	37 30 N.	145 40 E.	79
29	37 15 N.	145 17 E.	71
30	37 10 N.	145 10 E.	51
May 1	37 18 N.	145 30 E.	45
2	37 07 N.	145 20 E.	191
3	37 20 N.	145 09 E.	10
6	37 04 N.	145 00 E.	......
7	37 36 N.	145 15 E.	4
8	37 37 N.	145 40 E.	19
10	39 30 N.	144 40 E.	61
11	40 20 N.	145 35 E.	9
12	39 58 N.	144 45 E.	75
13	40 09 N.	145 49 E.	......
14	40 00 N.	144 51 E.	84
15	39 50 N.	144 45 E.	18
16	39 45 N.	144 15 E.	65
17	39 59 N.	145 55 E.	27
18	39 25 N.	145 15 E.	61
19	40 20 N.	144 40 E.	105
20	40 22 N.	144 35 E.	2
22	40 10 N.	143 40 E.	2
23	40 15 N.	143 33 E.	43
24	41 00 N.	143 37 E.	52
25	40 56 N.	143 23 E.	95
26	40 50 N.	143 10 E.	19
29	39 40 N.	144 20 E.	......
30	40 30 N.	144 00 E.	6
June 2	39 50 N.	145 05 E.	26
3	40 11 N.	145 05 E.	47
4	40 50 N.	144 35 E.	13
6	42 00 N.	145 05 E.	7
7	41 27 N.	145 35 E.	32
8	41 55 N.	143 56 E.	79
9	41 57 N.	143 50 E.	51
10	42 04 N.	143 50 E.	9
11	42 16 N.	144 35 E.	29
12	42 55 N.	145 20 E.	4
13	43 00 N.	147 00 E.	......
14	43 06 N.	147 56 E.	......
15	43 06 N.	147 41 E.	29
16	43 09 N.	147 20 E.	85
18	43 15 N.	147 00 E.	25
19	43 35 N.	147 05 E.	35
20	43 25 N.	147 18 E.	4
21	43 12 N.	147 33 E.	10
22	43 12 N.	147 33 E.	8
23	......	......	7
Total	......	......	1,819

IV.—THE JAPANESE GOVERNMENT AND THE FUR-SEAL QUESTION.

It has been repeatedly pointed out in these pages that the Japanese Government when it became possessed of the Middle and Northern Kurils in 1875, had no knowledge of the existence there of any fur-seal rookeries. In fact, the rookeries were not discovered until six years later, and so well was the secret of the exact location of these gold mines kept among the sealers of those days, almost exclusively foreign residents, that the Government did not know of the rookeries until they were practically annihilated. A lame effort was made in 1884 to prohibit "the hunting and catching of seals and sea otters in Hokkaido," but no effective means were taken to carry out the various decrees. It is even doubtful whether the authorities as late as 1891 had a full and clear conception of the difference between the seals and the sea otters, for not only does the memorandum of that year on the "Seal Fisheries in Japan," relate almost exclusively to the sea otter, but the various regulations of 1886 and 1888, although ostensibly meant to regulate the hunting of fur seals as well as sea otters, are framed in such a way that it is plain the authorities regarded them as practically the same.

EARLY DECREES FOR THE PROTECTION OF SEALS AND SEA OTTERS.

For the sake of completeness these early decrees[1] are here reprinted, as follows:

Extract from decree No. 16, of May 23, 17th year of Meiji (1884), promulgated by the minister of agriculture and commerce.

SEC. 14. Hereafter the hunting and killing of seals and sea otters in Hokkaido, except as hereinafter provided, is prohibited. Any person who shall be convicted of a violation of this regulation shall be punished in accordance with the terms of section 372 of the criminal code, and in addition the skins or other fruits of such unlawful hunting shall be summarily confiscated. If such skins, etc., shall have been sold, the offender shall be liable to the payment of a fine equal to the total amount received therefor. The minister of agriculture and commerce shall be empowered to grant to such persons as he may deem fit, and for such compensation as may be determined upon, a special permit to hunt seals and sea otters in Hokkaido, and to such persons the provisions of the foregoing prohibition shall not apply.

Imperial decree No. 80, December 16, 19th year of Meiji (1886).

ARTICLE 1. Any person who has obtained the special permission of the minister of agriculture and commerce, in accordance with the last paragraph of decree No. 16 of the 17th year of Meiji, may engage in catching seals and sea otters during the term, and within the limits of the places specified for the purpose by the Hokkaido Cho. Such person shall always carry the special permit when he is engaged in hunting, and whenever, whether at sea or on shore, any officer supervising seal and sea otter hunting, or any police officer, demands to inspect the same, he shall at once produce and show it.

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[1] The regulations of October, 1878 (Fur Seal Arb., II, pp. 232 and 267), although the translation makes them appear to relate to seal hunting, pertain exclusively to the sea otter and are therefore here omitted.

Article 2. Any person engaging in hunting seals and sea otters shall, on arrival in Hokkaido report the name and tonnage of his vessel and the names of her crew to the branch office named by the Hokkaido Cho, and shall at all times exhibit, fixed to the mast or some other conspicuous part of the vessel, a sign specially adopted by the Hokkaido Cho for vessels engaged in hunting seals and sea otters.

Article 3. Any person desiring to sell the raw skins of seals and sea otters shall produce the same to and have them stamped (or branded) by the branch office mentioned in article 2. No skins without this official stamp shall be permitted to be sold.

Article 4. Whenever it is found that any person is importing raw skins of seals and sea otters not stamped as provided in the foregoing article, into, or is staying with such skins on board his vessel in any port of the Empire, or is selling, or attempting to sell such skins in the market, the customs or police officers shall seize the same and shall immediately make complaint to the competent authorities, provided, however, that raw skins of seals and sea otters caught within the territory of Russia, or of the United States of America, with the permission of the Governments of those countries, respectively, may be imported into the Empire, upon the owner or master of the vessel producing a certificate issued by a competent authority of the Russia or the United States, or by a Russian or United States consul residing in the Empire.

Notification No. 35, May 10, 21st year of Meiji (1888), (promulgated by the Hokkaido Cho).

DETAILS OF PROCEDURE TO CARRY OUT THE REGULATIONS CONTROLLING THE SEAL AND SEA OTTER HUNTING.

Article 1. The open season for seal and sea otter hunting shall be from the 15th April to the 31st October in each year.

Article 2. The area of hunting shall be all the islands situated eastward of Iturup, and southward of Shimshu, of the Kurils, and it will be divided into three sections, and every year only one of these sections shall be opened for hunting.

The first section includes seven islands, i. e., Iturup, Chirihoi, Butettchelboa (?), Broughton, Raikoke, Mushir, and Chirinkotan.

The second section includes six islands, i. e., Shimishir, Shiritoi, Ushishir, Sredneva, Rashua, and Matsua.

The third section includes twelve islands, i. e , Shaunekotan, Yekarma, Karrenkotan, Onekotan, Avos, Makanrushi, Shurenwa (?), Paramushir, Holt, Cocksar, Alaid, and Shimshu.

Article 3. When a vessel is going out for hunting, her name, tonnage, and the names of her crew shall be reported for inspection to the branch office of seal and sea otter hunting superintending authorities, either at Nemuro, in the county of Nemuro, or at Shikotan, in the county of Chishima.

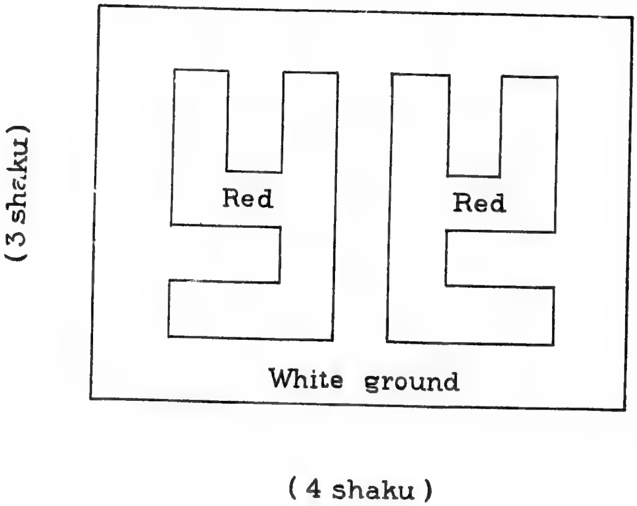
Article 4. When the branch office of seal and sea otter hunting superintending authorities find the report mentioned in article 3 in due form on inspection, it will give to the vessel a flag as hereinafter shown.

Article 5. Any person who wishes to export and sell the raw skins of his catch shall produce them to the Shikotan branch of the seal and sea otter hunting superintending authorities, and shall have them stamped.

It will be seen how utterly unsuitable these regulations were for the protection of the fur seals, however effective they might have been in preserving the sea otter, had they been carried out at all, but we are assured that they never were. M. de Bunsen, secretary of the British legation at Tokyo, wrote in November, 1891 (Fur Seal Arb., VI, p. 236), that these regulations "have remained entirely inoperative." "A Japanese guardship was told off this year to watch over their observance, but she never left her station at Nemuro, and except the Japanese Marine Products Company, now rapidly approaching bankruptcy, no one dreams of applying for the regulation license, or of limiting his operations to the group in which the fishery is legally permissible."

This supineness of the Japanese authorities is the more surprising since we are credibly informed that one of the chief raiders of the Kuril rookeries, before they

The Flag.



were exhausted, attempted to induce the Government to lease those islands to him upon a similar basis as the Russian and American seal islands were leased, but that he failed in spite of every effort, backed by powerful influence. The refusal was probably due to the "Japan for Japanese" principle, for we find that later (1889) an exclusive permission to hunt the seals and sea otters was given to the Dainippon Suisan Kaisha (The Japan Maritime Product Company) of Hakodate, subject to the above regulations. The few seals taken by the schooners of this company in the Kurils have been enumerated above (p. 259).

INVESTIGATIONS OF THE FUR-SEAL QUESTION BY THE JAPANESE GOVERNMENT.

The sudden reawakening in sealing interests which was the result of the successful pelagic sealing season of 1892 in Asiatic waters, also aroused the Japanese authorities, and the search for information, so long neglected, was delegated to the fisheries bureau of the department of agriculture and commerce in Tokyo. A report upon the whole seal question, including the trial and award of the Paris Arbitration Tribunal, was prepared and issued by the bureau in 1893, being chiefly a compilation from available American and British sources. At the same time young men with more or less scientific training were sent out to investigate the question, notably Mr. Nozawa and assistant in 1893, Mr. Niva in 1894, and Mr. Kitahara in 1895, to the Kurils, while Mr. Kaneda and Mr. Kaburaki, in 1894, were placed in two Japanese pelagic sealers, and Mr. Mori and Mr. Nagasi similarly in 1895. The reports of these gentlemen furnished a certain amount of information and have been published, except Mr. Nozawa's, which was not quite finished when I saw him last autumn in Hakodate.

These investigations led to the abolition of the old regulations and the framing of new ones to meet the altered conditions. There being no more rookeries on the Kurils to protect, no special notice has been taken of this side of the question, although the new law has vested enough power in the Government to take all the steps it may find necessary or desirable.

NEW LAW AND REGULATIONS FOR THE PROTECTION OF SEALS AND SEA OTTERS.

The old regulations were in force until the end of 1895. During that year a law passed the Japanese Parliament and received the imperial sanction in which are found the basis and authority for the regulations now in force. The act and the regulations have been kindly translated for me by the officials of the fisheries bureau of the department of agriculture and commerce, Dr. Kishinouye and Mr. Otaki, and are to the following effect:

Act No. 10. Issued March 2, 28th year of Meiji (1895). An act regulating the hunting of fur seals and sea otters.

ART. 1. Any person wishing to engage in hunting fur seals and sea otters shall have a license from the minister of agriculture and commerce.

ART. 2. With a view to protect the fur seals and sea otters the killing of these animals may be prohibited or limited by imperial decree with reference to (*a*) sex; (*b*) age; (*c*) season or locality; (*d*) methods of hunting, implements, and kind of vessels.

ART. 3. Commanders of vessels of the imperial navy, police officers, custom-house officers, and other commissioned officers are empowered to inspect, in accordance with the imperial decree, any vessel or implements used in hunting fur seals and sea otters, as well as the catches on board. Any person guilty of any breach of this decree, his vessel, implements, certificate of navigation, and catch shall be seized.

ART. 4. Any person guilty of having caught fur seals or sea otters within a prohibited area or during a prohibited season shall be liable to imprisonment with hard labor for from one month to not more than one year, or to a fine of from 20 yen to not more than 500 yen, together with confiscation of the vessel, implements, and catch on board, without regard to who the owner may be.

ART. 5. Any person guilty of any breach of sections *a*, *b*, and *d* of article 2, or of the regulations for inspection, shall be liable to imprisonment with hard labor for from eleven days to not more than one month, or to a fine of from 2 yen to not more than 50 yen.

ART. 6. Any person guilty of any breach of article 1 shall be liable to a fine of from 2 yen to not more than 50 yen, together with confiscation of the catch.

ART. 7. In cases liable under articles 4 and 6 to confiscation of the catch, if the latter has already been sold, the amount of such sale shall be collected.

ART. 8. This act shall be enforced from the 1st day of January, 29th year of Meiji (1896). From the said date decrees No. 16, of 17th year of Meiji (1884), and decree No. 80, of the 19th year of Meiji (1886), are revoked.

(Signed by His Imperial Majesty and countersigned by the president of the cabinet council and by the minister of agriculture and commerce.)

Regulations concerning the hunting of fur seals and sea otters. (Issued December 6, 28th year of Meiji (1895), by the minister of agriculture and commerce.)

ART. 1. Any person wishing to engage in hunting fur seals and sea otters shall apply for a license to the minister of agriculture and commerce through the governor of the precinct in which his vessel is registered or in which he resides. Persons living in Tokyo will apply through the chief director of police.

ART. 2. Such person shall specify in the application the following items:

(*a*) The kind of animal to be hunted.
(*b*) Registered home town, present residence, and rank.
(*c*) Number of vessels to be engaged, their names and tonnage.
(*d*) The registered home port of the vessel.
(*e*) Season of hunting and localities.
(*f*) Mode of hunting and implements.

ART. 3. Upon the approval of the application a license shall be issued to each vessel according to the following schedule:

ART. 4. Vessels thus licensed shall report their departure to the police station of the harbor or its branch station; and when they have finished their season's hunting they shall also apply for a stamp of inspection from the police station or its branch station at the registered home port or their last port during their cruise.

Neglect of having a stamp of inspection for more than two consecutive years shall render the hunting license void.

ART. 5. A licensed vessel shall fly a flag, as shown hereainfter, from the mast or other conspicuous place.

All boats belonging to the vessel shall have the name of the vessel painted in a conspicuous place.

ART. 6. A licensed vessel shall always carry the license, which shall be produced at once when demanded by any commander of an imperial naval vessel, police officer, custom-house officer, or any other commissioned officer.

ART. 7. The master of a licensed vessel shall submit within two months to the department of agriculture and commerce, through the governor of a precinct, a report detailing dates of catch; number of animals caught, locality; number of boats employed; number of officers, hunters, and sailors.

ART. 8. Should the license become lost, defaced, or destroyed, or if any change has taken place in the items specified under sections *b*, *c*, or *d* of article 2 of these regulations, the person to whom the license was issued shall request a governor of a precinct to reissue the same license or to correct the said items.

Front.

[Light blue paper.]

[Decorated border.]

Sea-otter and fur-seal hunting license.

Stamp.

Number.

Home town and rank.

Residence.

Name.

Name and kind of vessel.

Registered home port of vessel.

Meiji, year, month, day.

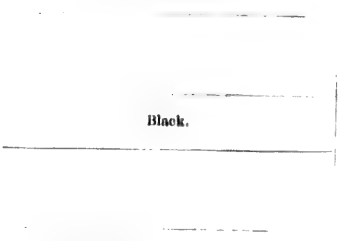
Department of Agriculture and Commerce.

Back.

Inspection by police.

Inspection stamp.	Date of inspection.	Inspection stamp.	Date of inspection.	Remarks.

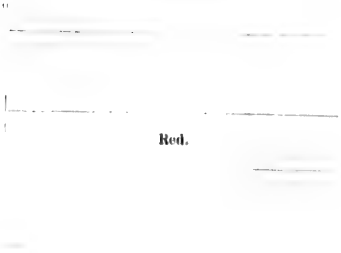
Fur-seal schooner flag.



Ground white.

Stripe black, one-fourth width of flag.

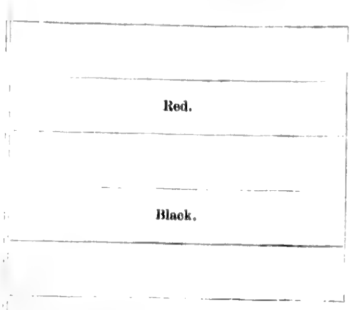
Sea-otter schooner flag.



Ground white.

Stripe red, one-fourth width of flag.

Sea-otter and fur-seal schooner flag.



Ground white.

Upper stripe red, lower black, one-fifth width of flag.

ART. 9. A holder of a license surrendering his rights under the same or having it expire under the provision of the last clause of article 4 of these regulations shall return at once his license to the proper authorities.

It will be seen that the above regulations impose practically no restrictions at all. All the intending sealer or sea-otter hunter has to do is to apply for a license, the application to contain certain information; to fly a special flag; to report for inspection by the police before departure and after return; to insure that the items in the application, which have no other than statistical interest, are still unaltered, and to furnish a report upon the cruise within a certain period. As a matter of fact, the regulations do not in any way regulate or attempt to regulate the hunting, but are simply framed to insure the return of certain statistical data.

This is rather surprising when we consider that the regulations apply as well to the sea otter as to the fur seal, and that the Japanese Government has always been anxious to extend all possible protection to the former, at least on paper. But the fact is that Japan has seen the utter futility of trying to regulate either business without an international agreement. No matter what restrictions she may impose they can not be enforced against the foreigners, and to keep the natives out and let the foreigner take the profit is entirely at variance with Japanese principles. Japan's only hope is for international cooperation, and for this she has now been anxiously waiting for nearly ten years.

Japanese sealers have received a direct encouragement from their Government in a law passed this year (1897) by the Japanese Parliament, by which, under certain conditions, a money subsidy is to be paid them. The law, for a period of five years, from April 1, 1898, to March 31, 1903, provides for a subsidy for sailing vessels of a tonnage of from 60 to 200 registered tons and for steamers of a tonnage of from 100 to 350 tons engaged in various specifically enumerated fisheries, among which are sea-otter hunting and sealing. The total amount appropriated is 150,000 yen per year, 10 yen to each of the crew, to be paid according to the following schedule: To 35 persons in a steamer of more than 100 tons, to 44 persons in a steamer of more than 200 tons, to 47 persons in a steamer of more than 250 tons, to 52 persons in a steamer of more than 300 tons, to 53 persons in a steamer of more than 350 tons, to 26 persons in a sailing vessel of more than 60 tons, to 28 persons in a sailing vessel of more than 80 tons, to 29 persons in a sailing vessel of more than 100 tons, to 31 persons in a sailing vessel of more than 140 tons, to 32 persons in a sailing vessel of more than 160 tons, to 34 persons in a sailing vessel of more than 180 tons, to 37 persons in a sailing vessel of more than 200 tons.

Four-fifths of the crew of the vessel must be Japanese subjects in order to earn the subsidy, and the fishing must take place in the following waters only: China Sea, Formosa Channel, Eastern Sea, Yellow Sea, Korea Channel, Japan Sea, Okhotsk Sea, Pacific Ocean. (From a translation kindly furnished me by Mr. Kitahara, of the fisheries bureau, imperial department of agriculture and commerce, Tokyo.)

JAPAN'S EFFORT TO JOIN AN INTERNATIONAL ARRANGEMENT.

When the United States, in 1887, was trying to protect its own fur-seal interests against the increasing Canadian pelagic sealing by inviting the cooperation of other interested nations, our minister at Tokyo could at once report home that "the Japanese Government is anxious to enter into an arrangement or convention with the United

States Government, invoking similar arrangement or convention with our Government for the protection of the fur-seal fisheries in the waters of their northern islands." Scarcely more than a week later the Japanese minister of foreign affairs, Count Ito Hirobumi, defined the standpoint of his own Government as follows:

> The unregulated and indiscriminate slaughter of the sea otter, as well as the fur seal, on the coasts of Japan and in their conterminous waters, is a subject which has for many years engaged the serious attention of the Imperial Government.
>
> The experience of His Imperial Majesty's Government justifies the belief that the aid sought to be obtained can be best secured by means of a cooperative international action, and they therefore cordially approve of the suggestion of the honorable the Secretary of State.
>
> His Imperial Majesty's Government would be willing to enter an arrangement for the purpose indicated, but they would wish, for the reasons assigned by Mr. Bayard in favor of the protection of the fur seal in Bering Sea, to extend the principle of protection to the sea otter as well as the fur seal, and to enlarge the protected zone so as to embrace the known habitat of that animal.

Count Ito at once struck the keynote to Japan's position—the desire to include the sea otter in any contemplated arrangement—and to this proposition she has wisely held all these years.

In the meantime negotiations were carried on in London between Great Britain, the United States, and Russia, and the prospects at one time were quite favorable to a practical solution. This lasted until July, 1888, when, Japan becoming impatient at hearing no more of the matter, brought the question up again. The immediate reason for the increased anxiety of the Japanese Government to reach an international agreement was the unfortunate *Nemo* affair off Copper Island, when, during an attempted raid of the sea-otter rookery by the schooner *Nemo*, sailing from Japan, three Japanese sailors were killed and several others wounded by the bullets of the Copper Island guards. The first step was to ask the United States Government to instruct its consuls in Japan to refrain from shipping Japanese subjects on board any American vessels engaged or about to engage in otter or seal hunting. To her request for being allowed to take part in the pending negotiations in London, Japan was somewhat superciliously informed that she had better wait until the other powers had come to an agreement; and as for the sea otter which she was so anxious to protect, the then Secretary of State wrote our representative in Tokyo as follows, under August 9, 1888:

> The convention which Japan will seek to make on the same subject will, as you have indicated, have to be shaped in some respects so as to meet the wishes of Japan in regard to the protection of her interests in the sea otter. What this Government deems necessary for the preservation of the seals in Bering Sea is entirely to prohibit the slaughter of them with firearms, nets, and other destructive implements, at a distance from the coasts. The Department would be glad to learn the views of the Japanese Government concerning the measures necessary for the protection of its interests in the otter, and to be furnished with information respecting their territorial and pecuniary extent.

Our Government then wrote as if we ourselves had no interest in the sea otter, and seemed to think that Japan is the only country concerned in the matter. There was Russia with an interest in the same animal as great as that of Japan, and there were the American interests, greater than that of the two others together. It might well have paid to have taken the hint from Japan. The shortsightedness, or ignorance, of our own Government in this matter can only be explained by the overshadowing immediate importance of the seal questions. And in the meantime the negotiations in London concerning the latter, which came so near being terminated favorably, collapsed suddenly upon the imperious demand of Canada.

THE PRESENT INTERESTS OF JAPAN AND THE POSITION OF HER GOVERNMENT.

From what is shown in this report it is plain that Japan's interest in the fur-seal question is materially changed since she first signified her willingness to join in an international agreement for their protection. In 1887 she had yet hopes of saving the rookeries in the Kurils and she had absolutely no interest in pelagic sealing, which was not yet thought of in Asiatic waters. Now all that is changed. Japan knows that she has no fur-seal rookeries any more, and many of her subjects have tasted the sweets of pelagic sealing.

The position of the Japanese Government with reference to pelagic sealing is a somewhat peculiar and conflicting one. I have on a previous page pointed out the three classes into which the pelagic sealing interests in Japanese waters may be divided, viz: (1) That of the American and British schooners, which only come across for part of the year and then return, having taken the bulk of the pelagic catch; (2) that of the resident foreigners hunting with foreign crews; and (3) that of the native owners, whose vessels and crews are entirely Japanese. Naturally the Japanese Government has absolutely no interest in the first-mentioned class. On the contrary, they have taken the cream of the business and left nothing but the picked bones for the people who live in Japan, and the Government would only be too glad if there were a way by which the pelagic sealing, or so much of it as may be allowed, could be reserved for the inhabitants of its own territory.

On the other hand, it can not be doubted that the enlightened Government of Japan is fully aware of the fact that the pelagic sealing is killing the goose that laid the golden egg, and that it must surely cease entirely at some not very distant future, if measures are not soon taken to stop the terrible drain upon the breeding herds.

Moreover, Japan's interest in the sea otter, in spite of the great decline in the number of this animal in recent years, due to lack of protection, is still considerable enough to make her accede to any measures protecting the seals, provided they be coupled with a proviso for the protection of the sea otter.

It will, therefore, be readily seen that Japan's real interest lies in the protection of both animals, and there can be no reasonable doubt but that she would gladly join any agreement that would insure the perpetuity of both as sources of income to her subjects.

C.—APPENDICES.

I.—REPORTS UPON THE INSECTS, SPIDERS, MITES, AND MYRIAPODS COLLECTED BY DR. L. STEJNEGER AND MR. G. E. H. BARRETT-HAMILTON ON THE COMMANDER ISLANDS.

Edited by WILLIAM H. ASHMEAD,
Assistant Curator, Department of Insects, U. S. National Museum.

In the following pages will be found the reports of the several specialists connected with the National Museum and the Department of Agriculture upon the insects, spiders, mites, and myriapods collected by Dr. Leonhard Stejneger and Mr. G. E. H. Barrett-Hamilton on the Commander Islands.

As may be seen from the records, Dr. Stejneger has been collecting on the islands since 1882, and has brought together probably the largest number of species of Arthropoda ever made in this high latitude.

The collection is, therefore, not only interesting from a geographical standpoint, as showing the wide distribution of some of the species, but also for the many new species taken during his several trips to these far-away islands.

The Coleoptera taken previously to 1897 were worked up by the late Martin L. Linell; those taken later, by Mr. E. A. Schwarz; the Hymenoptera and Hemiptera by myself; the Lepidoptera by Dr. H. G. Dyar; the Diptera by Mr. D. W. Coquillett; the Arachnida and Neuropteroid insects by Mr. Nathan Banks; while the Myriapods were determined by Prof. O. F. Cook.

Order COLEOPTERA.

(By Martin L. Linell and E. A. Schwarz.)

Family CARABIDÆ.

(1) ***Elaphrus riparius*** Linnæus. Faun. Suec., No. 749. Jacq. Duval, Gen. Carab., t. 2, f. 6. Schaum, Nat. Ins., I, p. 72. Schiödte, Nat. Tids., t. 13, 1866, f. 9–11.
paludosus Oliv., Ent., II, 34, p. 5, t. I, f. 4–a. b. Heyden, Deutsche Ent. Zeits., 30, 1886, p. 294. Heyden, Cat. Coleop. v. Sibir., 1895, p. 13.

Komandor, Bering Island. Three specimens, August 29, 1882; Kluchevski (Dr. L. Stejneger).

Geographical distribution.—This species is found in Europe, Siberia, and boreal America to Vermont in the East and New Mexico in the South.

(2) ***Lorocera pilicornis*** Fabricius. Syst. Ent., p. 243. Jacq. Duv., Gen. Carab., t. 4, f. 20. Schaum, Nat. Ins., I, p. 315. Gernet, Hor. Soc. russ., V, 1867.
ænea Latr., Gen. Crust. et Ins., I, p. 271.
var. *rufilabris* Motsch., Bull. Mosc., IV, 1845, p. 340. Heyden, Deutsche Ent. Zeits., 1885, p. 300. Heyden, Cat. Coleop. v. Sibir., 1895, p. 13.

Bering Island. One specimen (Dr. L Stejneger).

(3) *Nebria dubia* Sahlberg. Vega 1885, 63, 69. Heyden, Cat. Coleop. v. Sibir., 1895, p. 12.

Nikolski, Bering Island. Four specimens, July 28, 1882 (L. Stejneger); five examples, 1897 (Barrett-Hamilton); Topokof Island, three specimens, May 21, 1882, two examples in 1883 (Stejneger); Komandor, one example, August 29, 1882 (Stejneger); Copper Island, three examples, August, 1895 (Stejneger); five examples by Barrett-Hamilton in 1897; Kluchevski, Kamchatka, one example in 1897 (L. Stejneger).

Geographical distribution.—Kamchatka, East Siberia.

The species is exceedingly close to *N. sahlbergi* Fischer, distributed over Arctic America from Kenai to Mount Washington, N. H. Specimens from British Columbia are exactly like the dark form from Commander Islands.

(4) *Nebria septentrionis* Motschulsky (?)

Glinka. One example in 1897 (Dr. Stejneger).

(5) *Notiophilus aquaticus* Linnæus. Faun. Suec., No. 752. Sturm, Ins., VII, p. 142, t. 183, f. 0. Schaum, Nat. Ins., I, p. 62. Schiödte, Nat. Tids. 1866, t. 13, f. 19. J. Sahlberg, Vega 85, 69. Heyden, Cat. Coleop. v. Sibir., 1895, p. 13.

Copper Island. One example, August, 1895 (Stejneger).

Geographical distribution.—Northern and middle Europe, northern Asia and Alaska.

(6) *Patrobus septentrionis* Dejean. Spec., III, p. 29. Jacq. II, t. 106, f. 2. Schaum, Nat. Ins., I, p. 377. Schönh. Dejean, Cat. 3d Ed., p. 32.
alpinus Curtis, Brit. Ent. IV, t. 192.
hyperboreus Dej., Spec. III, p. 30; id. Cat.
picicornis Zetterst. Faun. Lapp., I, p. 32.
rufipes var. c. Gyll., Ins. Suec., II, p. 97.
var. *marginatus* Eschsch., Dej. Cat.
var. *serenus* Gredler, Käf. Tirol., 1863, p. 28. J. Sahlberg, Vega 85, 63, 69. Heyden, Cat. Coleop. v. Sibir., 1895, p. 16.

Nikolski, Bering Island, two examples July 28, 1882 (L. Stejneger); four specimens in 1897 (Barrett-Hamilton); Preobrazhenski, Copper Island, one specimen, May 6, 1882, and another August, 1895 (Stejneger). In 1897 Mr. Barrett-Hamilton took three specimens on same island.

Sahlberg records a single specimen taken by the Vega expedition on Bering Island.

Geographical distribution.—Arctic Europe, Siberia, and Arctic America to Michigan and New Hampshire.

(7) *Trechus chalybeus* Mannerheim. Bull. Mosc., 1843, p

Copper Island, one example; Bering Island, one example, taken by Mr. Barrett-Hamilton in 1897.

(8) *Lirus melanogastricus* Dejean. Spec., III, p. 519. Mannerh., Bull. Mosc., 1843, II, p. 210. Eschsch., Dej. Cat., 3d. Ed., p., 45.
melanogaster Sturm, Cat., 1st Ed., p. 91. Gemminger et Harold, Cat., I, p. 341. Heyden, Cat. Coleop. v. Sibir., 1895, p. 23.

Nikolski, Bering Island, three examples, July 28, 1882 (L. Stejneger); one example, 1897 (Barrett-Hamilton); Preobrazhenski, Copper Island, one example, May 6, 1882 (L. Stejneger); one example in 1897, (Barrett-Hamilton

Geographical distribution.—Kamchatka, Unalaska, Kad

(9) *Celia remotestriata* Dejean. Spec. III, p. 473. Leconte, Proc. Acad. Phil., 1855, p. 354. Eschsch., Dej. Cat., 3d ed., p. 44.
remota Zimmerm., Mon. I, p. 27. Eschsch., St. Cat., 1826, p. 91.
var. *indistincta* Mannerh., Bull. Mosc., 1853, III, p. 137. Motsch., Kaäf. Russ., p. 59. Gemminger et Harold, Cat., I, p. 346.

Bering Island, four specimens, July, 1895 (Stejneger); Copper Island, three examples in 1897 (Barrett-Hamilton).

Geographical distribution.—Kamchatka, Alaska to New York in the East and to Northern California and New Mexico in the South.

(10) *Pseudocryobius empetricola* Dejean. Spec. III, p. 331. Eschsch., Dej. Cat., 3d ed., p. 40.
laticolle Sturm, Cat., 1826, p. 91. Gemminger et Harold, Cat. Coleop., I, p. 318. Heyden, Cat. Coleop. Sibir., 1895, p. —.

Nikolski, Bering Island, two specimens, July 28, 1882; one specimen, August, 1897 (Stejneger); Sissonkovaya, B. I., August, 1882 (Stejneger); Copper Island, one example, August, 1895 (Stejneger); five specimens, 1897 (Barrett-Hamliton).

(11) *Bradycellus cognatus* Gyllenhaal. Fn. Suec., IV, p. 455. Dej. Jacq., IV, t. 194, f. 3.
Deutschi Sahlb., Diss. ins Fenn., p. 261.
longiusculus Mannerh., Bull. Mosc., 1853, III, p. 125.
var. *nitens* Lec., Proc. Acad. Phil., 1856, p. 60. Gemminger et Harold, Cat. Coleop., I, p. 263.

Nikolski, Bering Island, two specimens, July 28, 1882; two July, 1895, and three in August, 1897 (Dr. Stejneger).

Geographical distribution.—Northern Europe, Siberia, Arctic America to New Hampshire, and Southern California.

Family DYTISCIDÆ.

(12) *Colymbetes dolabratus* Paykull. Mkl. Ofv., 81, p. 22. Heyden, Cat. Coleop. Sibir., 1895, p. 32.

Nikolski, Bering Island, five specimens, July 28, 1882; three specimens, August, 1897 (Dr. Stejneger).

Goographical distribution.—Northern Europe, Siberia, and Arctic America.

(13) *Deronectes griseostriatus* De Geer. Ins., IV, p. 103. Sturm, Ins., IX, p. 21, t. 204. f. a. Aubé, Spec., p. 541.
catascopium Say, Trans. Am. Phil. Soc., II, p. 03.
interruptus Say, l. c., IV, p. 445.
parallelus Say, Journ. Acad. Phil., III, p. 153.
halensis Payk., Fn. Suec., I, p. 230.
quadristriatus Eschsch., Mem. Mosc., VI, p. 107. Gemminger et Harold, Cat. Coleop., II, p. 434. Mkl. Ofv., 1881, p. 22. Heyden, Cat. Coleop. Sibir., 1895, p. 31.

Nikolski, Bering Island. One example, July 28, 1882 (Stejneger).

Geographical distribution.—Northern Europe, Siberia, and Arctic America.

(14) *Hydroporus morio* Sharp.

Bering Island. Three examples, July–August, 1897 (Stejneger).

(15) *Dytiscus daurious* Gebler. Nouv. Mem. Mosc., II, p. 39. Gemminger et Harold, Cat. Coleop., II, p. 461.

Bering Island. One example, September, 1895 (Stejneger).

This species has been previously reported only from Siberia. Dr. Stejneger also took a single specimen of *Rhantus notaticollis* Aubé in 1897, at Kluchevski, Kamchatka.

Family SILPHIDÆ.

(16) *Silpha lapponica* Linnæus. Herbst, Käf., V, p. 209, t. 52, f. 4. Kirby, Fn. Bor. Am., p. 100. Leconte, Synop., p. 278.
californica Mannerheim, Bull. Mosc., 1843, II, p. 253. Eschsch. Dej., Cat., 3d ed., p. 132.
caudata Say, Journ. Acad. Phil., III, p. 192.
aranigera Chevrol., Col. Mex., 1831, I, No. 1.
rugoso var., Linné, Fn. Suec., No. 455.
tuberculata Germ., Ins. spec. nov., p. 81. Gemminger et Harold, Cat. Coleop., II, p. 722.

Bering Island. Two examples in 1882, ten in 1897 (Stejneger).

Geographical distribution.—Northern Europe, Siberia, and Arctic America to New Mexico and Vermont.

(17) *Lyrosoma opacum* Mannerheim. Bull. Mosc., 1853, p. 175. J. Sahlberg, Vega, 1885, 66, 70. Heyden, Cat. Coleop. Sibir., 1895, p. 53.

Nikolski, Bering Island. One example, July, 1895; one in 1897, and three specimens from Glinka, Copper Island, all taken by Dr. Stejneger.

Sahlberg records a single specimen from Bering Island, collected by the Vega expedition.

Geographical distribution.—Kamchatka, St. Paul, Apognak and Atkha Island.

(18) *Lyrosoma pallidum* Eschscholtz. Zoologischer Atlas, I, p. 7, Tab. VIII, f. 8. Mannerheim, Bull. Mosc., 1853, p. 175 (footnote).

Copper Island, two examples; Glinka, Copper Island, six examples, taken July-August, 1897 (Dr. Stejneger).

(19) *Anisotoma abbreviata* Sahlberg. Vega, 1885, 65, 75. Heyden, Cat. Coleop. Sibir., 1895, p. 53.

Bering Island, two examples, 1897 (Stejneger).

Sahlberg recorded one example from Bering Island, collected by the Vega expedition. The species, so far as known, seems peculiar to the island.

(20) *Agathidium rotundatum* Mannerheim. Mannerheim, Bull. Mosc., 1852, p. 370, No. 176.

Nikolski, Bering Island. One example, July 28, 1882 (Dr. Stejneger).

Geographical distribution.—Sitka and Queen Charlotte Island.

Family STAPHYLINIDÆ.

(21) *Creophilus maxillosus*, var. *villosus* Gravenhorst. Micr., p. 160. Erichs., Gen., p. 349.
♀ *fasciatus* Casteln., Étud. ent., p. 111.
♂ *mandibularis* Eschsch., in litt. Gemminger et Harold, Cat. Coleop., II, p. 575. Heyden, Cat. Coloep. Sibir., p. 41.

Bering Island, North Rookery, three examples, July, 1895; Glinka, Copper Island, one example, 1897 (Stejneger).

Geographical distribution.—North American Continent south to Guatemala. *C. maxillosus* Linn. occurs over the whole Palearctic region.

(22) *Quedius sublimbatus* Mäklin. Mäklin, Bull. Mosc., 1853, III, p. 190. Gemminger et Harold, Cat. Coleop., II, p. 575. Heyden, Cat. Coleop. Sibir., p. 41.

Nikolski, Bering Island, one example, July 28, 1882 (Stejneger); Copper Island, one example, 1897 (Barrett-Hamilton).

(23) *Quedius hyperboreus* Erichson. Gen., p. 547.
Fellmani Zetterstedt., Ins. Lapp., p. 62 (*forte*). Gemminger et Harold, Cat. Coleop., II, p. 570.

Nikolski, Bering Island. One example, July, 1882 (Stejneger).

Geographical distribution.—Northern Europe, Siberia, Aleutian Islands to Colorado and Maine.

(24) ***Philonthus æneus*** **Rossi.** Faun. Etr., I, p. 249. Kraatz, Nat., p. 578. Schiödte, Nat. Tidsskr., 1864, t. 12, f. 1.
cyanicornis Mannerh., Brachel, p. 27.
laticeps Zetterst., Faun. Lapp., I, p. 73.
mandibularis Kirby, Faun. Bor. Am., p. 91.
metallicus Lac., Faun. Par., I, p. 390.
politus Linné, Syst. Nat., I, 2, p. 683 (pars.). Kirby, Fn. Bor. Am., p. 91.
puncticollis Step., Ill. Brit., p. 439.
similis Marsh, Ent. Brit., p. 497.
var. *atratus* Lac., Faun. Par., I, p. 392. Gemminger et Harold, Cat. Coleop., II, p. 584. Heyden, Cat. Coleop. Sibir., 1895, p. 42.

Bering Island. One example (Dr. Stejneger).

Geographical distribution.—Europe, North America, etc.; very nearly cosmopolitan.

(25) *Thamiaræa cinnamonea* Gravenhorst. Micr., p. 88. Kraatz, Nat., p. 289.
pallipes Stephens, Ill. Brit., V, p. 132. Gemminger et Harold, Cat. Coleop., II, p. 533.

Bering Island. One example (Dr. Stejneger).

Geographical distribution.—Northern Europe.

(26) *Liogluta graminicola* Gravenhorst. Grav., Mon., p. 176. Kraatz, Nat., p. 212.
foveola Steph., Ill. Brit., V, p. 124.
granulata Mannerh., Bull. Mosc., 1846, II, p. 508.
linearis Mannerh., Brachél, p. 79.
longicornis var., *b.* Gyll., Ins. Suec., II, p. 405.
longiuscula Gyll., l. c., p. 485.
moesta Zetterst., Faun. Lapp., I, p. 101.
nigrina Aubé, Ann. Fr., 1850, p. 304.

Nikolski, Bering Island. Two examples, July, 1882, and one in July, 1895 (Dr. Stejneger); Copper Island, one example, 1897 (Mr. Barrett-Hamilton).

Geographical distribution.—Northern Europe, Siberia, Aleutian Islands to Queen Charlotte Island.

(27) *Atheta aquatica* Thomson. Skand. Coleop., III, p. 65.

Bering Island. Six specimens, July, 1895 (Dr. Stejneger), and 25 specimens, July-August, 1897 (Barrett-Hamilton and Stejneger).

(28) *Acheta* sp.

Glinka, Copper Island. Five specimens, July-August, 1897 (Dr. Stejneger).

(29) *Oxypoda opaca* Gravenhorst. Micr., p. 89. Kraatz, Nat., p. 165.
pulla Grav., l. c., p. 96.
umbrata Stephens, Ill. Brit., V, p. 148. Gemminger et Harold, Cat. Coleop., II, p. 529.

Bering Island.

Sahlberg records one example from this island collected by the Vega Expedition.

Geographical distribution.—Europe and Northern Asia.

(30) *Polystoma*, new species.

Bering Island. Four specimens (Barrett-Hamilton) and one specimen (Stejneger), July-August, 1897.

(31) *Arpedium brunnescens* Sahlberg. Vega, 85, 64, 70. Heyden, Cat. Coleop. Sibir., 1895, p. 48.

Nikolski, Bering Island. One example, July, 1882 (Stejneger); one example, August, 1897 (Barrett-Hamilton); Topokoff Island, one example (Stejneger); Glinka, one example, July, 1897 (Stejneger).

Sahlberg records two specimens from Bering Island collected by the Vega Expedition.

Geographical distribution.—Arctic Europe, Siberia, and Lake Superior region in North America.

(32) *Olophrum consimile* Gyllenhaal. Ins. Suec., II, p. 199. Kraatz, Nat., p. 941.
boreale o Payk. Faun. Suec., III, p. 411. Gemminger et Harold, Cat. Coleop., II, p. 660.

Bering Island. One example (Dr. Stejneger).

Geographical distribution.—Northern Europe.

(33) *Tachyporus jocosus* Say. Trans. Am. Phil. Soc., IV, p. 466.
arduus Erichson, Gen., p. 237. Gemminger et Harold, Cat. Coleop., II, p. 559. J. Sahlberg, Vega, 85, 64, 70. Heyden, Cat. Coleop. Sibir., 1895, p. 40.

Nikolski, Bering Island. One example, July, 1882 (Stejneger).

J. Sahlberg records one example under *T. arduus* Erichson from Bering Island collected by the Vega Expedition.

Geographical distribution.—Finland, Siberia, and North America in central and northern Atlantic States west to Colorado and New Mexico.

(34) *Mycralymma dicksoni* Mäklin. Ofv., 1881, 25, 42. J. Sahlberg, Vega, 85, 28, 42, 70. Hayden, Cat. Coleop. Sibir., 1895, p. 49.

Copper Island. One example, August, 1897 (Barrett-Hamilton).

(35) *Mycetoporus splendidus* Gravenhorst. Mon., p. 24. Kraatz, Nat., p. 466. Jacq. Duv., Gen. Staph., t. 11, f. 52.
elegans Matthews, Ent. Mag., V, p. 197.
nitidulus Dahl. in litt.
picipes Steph., Ill. Brit., V, p. 176.
ruficollis Steph., l. c., p. 176.
tenuis Steph., l. c., p. 169.
var. *pallidulus* Mannerh., Brachel, p. 63.
var. *subruber* Heer Fn. Helv., I, p. 586. Gemminger et Harold, Cat. Coleop., II, p. 565.

Nikolski, Bering Island. One example, July, 1882 (Stejneger).

Geographical distribution.—Palæarctic region and subarctic America.

Family CUCUJIDÆ.

(36) *Silvanus surinamensis* Linnæus. Syst. Nat., I, 2, p. 565. Steph., Ill. Brit., III, p. 104. Leconte, Proc. Acad. Phil., 1854, p. 77. Westwood, Intro., Class., I, p. 152, t. 13, f. 10–11.
cursor Fabr., Syst. El., I, p. 126. Schaum, Stett. Zeit., 1847, p. 42.
frumentarius Fabr., Syst. El., II, p. 557. Oliv., Ent., II, 18, p. 10, t. 2, f. 13. Erichs., Nat. Ins., III, p. 336. Sturm, Ins., XXI, p. 90, t. 388.
serricollis Sturm, Cat., 1843, p. 235.
sexdentatus Fabr., Syst. El., I, p. 317. Gyllenh., Ins. Suec., III, p. 406. Blisson, Ann. Fr., 1849, p. 163, t. 6, I. Gemminger et Harold, Cat. Coleop., III, p. 879.

Bering Island. One example (Dr. Stejneger).

Geographical distribution.—Cosmopolitan.

Family LATHRIDIIDÆ.

(37) *Lathridius protensicollis* Mannerheim. Bull. Mosc., II, 1843, p. 299. Gemminger et Harold, Cat. Coleop., III, p. 898.

Nikolski, Bering Island. One example, December 5, 1882 (Stejneger).

Geographical distribution.—Kadiak, Sitka.

(38) *Corticaria spinulosa* Mannerheim. Bull. Mosc., 1852, II, p. 361. Gemminger et Harold, Cat. Coleop., III, p. 903.

Bering Island. One example, 1882 (Stejneger).

Family BYRRHIDÆ.

(39) *Byrrhus fasciatus* Olivier. Ent., II, 13, p. 6, t. I, f. 2. Fabr. Ent. Sus., I, p. 85. Steff. Mon., p. 18. Erichs., Nat. Ins., III, p. 485.
dorsalis Panz., Faun. Germ., 104, 3. Sturm, Ins., II, p. 101. Duft. Faun. Austr. III, p. 11.
stoicus Fabr., Faun. Gronl., p. 184.
var. *cinctus* Ill., Käf. Preuss., p. 91.
var. *arcuatus* Sturm, Dej. Cat. 3d ed., p. 145. Zenker. Sturm, Cat. 1843, p. 98.
var. *dorsalis* Kugel, Schneid. Mag., IV, p. 354.
var. *Dianæ* Fabr., Syst. El., I, p. 103. Illig., Käf. Preuss., p. 92.
var. *cinctus* Sturm, Ins., II, p. 98, t. 34, f. D.
var. *pilula* var. c. Payk. Faun. Suec., I, p. 74. Gemminger et Harold, Cat. Coleop., III, p. 925.

Copper Island. Two examples, 1897 (Barrett-Hamilton); Bering Island, one example, 1897 (Dr. Stejneger).

Family ELATERIDÆ.

(40) *Cryptohypnus littoralis* Eschscholtz. Thon. Arch., II, p. 34. Cand., Mon., III, p. 75, t. 2, f. 4. Gemminger et Harold, Cat. Coleop., V, p. 1544.

Bering Island. One example (Dr. Stejneger); Copper Island, one example, August, 1897 (Barrett-Hamilton).

Geographical distribution.—Kamchatka, Unalaska, Kenai.

(41) *Cryptohypnus musculus* Eschscholtz. Entomogr., I, 1822, p. 70. Cand., Mon., III, p. 64. Gemminger et Harold, Cat. Coleop., V, p. 1544.

Nikolski, Bering Island. Two examples, July, 1882 (Stejneger); six examples, August, 1897 (Barrett-Hamilton); Copper Island, five specimens, August, 1895 (Stejneger); one example, August, 1897 (Barrett-Hamilton).

Geographical distribution.—Aleutian Islands, Queen Charlotte Island.

(42) *Corymbites ligneus* Candèze.

Bering Island. Two specimens (Barrett-Hamilton), and three specimens by Dr. Stejneger in July–August, 1897.

Family PTINIDÆ.

(43) *Ptinus fur* Linnæus. Fn. Suec., 1761, p. 190. Boield., Mon., p. 642. Sturm. Fn., XII, p. 48, t. 249. DeGeer, Mem., 1752, IV, 5, p. 234, t. 9, f. 1–3. Latr., Hist. Nat. Crust., IX, p. 164, etc. Gemminger et Harold, Cat. Coleop., VI, p. 1764.

Copper Island, one example, July, 1883 (Stejneger).

Geographical distribution.—Cosmopolitan.

Family ÆGIALITIDÆ.

(44) *Ægialites californicus* Motschulsky. Bull. Mosc., I, 1845, p. 33.
debilis Mannerheim, l. c., 1853, III, p. 180. Gemminger et Harold, Cat. Coleop., VII, p. 2041.

Bering Island. One example, 1882; eight specimens, 1895; Topokoff, one example, 1883; Staraya Gavan, seven examples, April 24, 1883; Preobrazhenski, Copper Island, eight specimens, June 28, 1883.

This remarkable insect was for a long time known in only a single specimen in the cabinet of Motschulsky, labeled "California," and was placed in the Dejean catalogue of 1837, among the Scydmænidæ.

Mannerheim, Bull. Mosc., 1853, III, p. 180, had seen two more specimens, one taken at Sitka by Fred. Sahlberg; the other by Holmberg at Workneseutk Bay, Kenai.

In the last few years it has been collected in numbers on Pribilof Islands and Queen Charlotte Island. A very much smaller species of this same genus was discovered by Mr. Chas. Fuchs, in Mendocino County, Cal., and named by Dr. Horn *Ægialites Fuchii.* A third species has now been discovered by Dr. Stejneger on Robben Island.

NOTE.—The description of this species, since the death of Mr. Linell, has been published under the name *Ægialites stejnegeri* Linell, in Canadian Entomologist, Vol. XXX, March, 1898, p. 74.

Family CURCULIONIDÆ.

(45) *Sitones lineellus* Bonds. Curc. Suec., II, p. 30, f. 18. Gyllh., Ins. Suec., III, p. 281. Schh., Gen. Curc., II, p. 111. Allard, Mon., p. 354.
occator Herbst. Käf., VI, p. 219, t. 75, f. 8.
var *scissifrons* Say, Descrip. Curc., p. 10.
var *indifferens* Say, l. c. Gemminger et Harold, Cat. Coleop., VIII, p. 2207.

Bering Island.

A single specimen was collected by the Vega expedition in this island, as reported by J. Sahlberg.

Geographical distribution.—Europe, Amur and Boreal America.

(46) *Lepyrus palustris* Scopoli. Ent. Carn., p. 33.

Top of Preobraghenskaya Sopka, Bering Island, 1,900 feet above sea level. One example was taken by Dr. Stejneger on July 20, 1883.

Geographical distribution.—Europe, Siberia, Arctic America to New Hampshire and New Mexico.

(47) *Erycus morio* Mannerheim.
Eriohinus morio Mannerheim, Bull. Mosc., II, 1853, p. 240.
Erycus morio Leconte & Horn, Rhynch. of N. A., p. 163.

Bering Island, one example, 1883 (Stejneger).

Geographical distribution.—Arctic America. This is a variety of *E. æthiops* Fabr., from northern Europe and Siberia.

(48) *Trachodes ptinoides* Germ. Germ., Spec. Nov., p. 327. Sch. Curc., III, p. 513. Mannerheim, Bull. Mosc., 1843, p. 293. Leconte & Horn, Rhynch. of N. A., p. 190.

Glinka, Copper Island. Five examples, July-August, 1897 (L. Stejneger).

Order LEPIDOPTERA.

(By H. G. Dyar, Ph. D.)

Family SPHINGIDÆ.

(1) *Macroglossa* sp., near *stellatarum* Linn.

Bering Island, August, 1883 (Dr. Stejneger).

Family NOCTUIDÆ.

(2) *Agrotiphila alaskæ* Grote. Bull. Buffalo Soc. Nat. Sci., III, p. 84, pl. 4, fig. 1. Smith, Bull. U. S. N. M., No. 38, p. 54. Smith, Bull. U. S. N. M., No. 44, p. 110.

Copper Island.

(3) *Calocampa vetusta* Hübner.

Bering Island, August 25, 1883 (Dr. Stejneger).

Family GEOMETRIDÆ.

(4) *Xanthorhoe glacialis* Hulst, Can. Ent. XXX, 1898, p. 119.

Bering Island, (Stejnerger); Alaska.

Type.—No. 3925, U. S. N. M.

(5) *Xanthorhoe longula* Hulst, Can. Ent. XXX, 1898, p. 119.

Type.—No. 3926, U. S. N. M.

Bering Island (Stejneger)

The following species were also taken by Dr. Stejneger at Kluchevski, Kamchatka: *Arctia caja* Linn., *Nemeophila modesta* Pack., *Erebia ligea* Linn., *Pieris napi* Esp., *Neptis ludmilla* H.-Scht., *Vanessa urticæ* Linn., *Argynnis daphne* D. & F. (melanic form).

Order HYMENOPTERA.

(By William H. Ashmead.)

Family APIDÆ.

(1) *Bombus sitkensis* Nylander. Notis. Saellsk. faun. & fl. Fenn. Förh., I, 1848 (Adnot.), p. 235, ♀ ♂. Cress., Proc. Ent. Soc. Phil., II, 1863, p. 102, ♀ ♂. Dalla Torre, Ber. naturw.-mediz. Ver. Innsbr., XII, 1882, p. 11, ♂. Handlirsch, Ann. naturh. Hofmus. Wien, III, 1888, p. 232. Dalla Torre, Cat. Hym., X, 1896, p. 549.

Bering Island. One female and three workers, August 1897 (Mr. Barrett-Hamilton).

(2) *Bombus moderatus* Cresson. Proc. Ent. Soc. Phil., II, 1863, p. 109. Cr., l. c., p. 99 nec Smith, ♀.

Bering Island. One female, July, 1895 (Dr. Stejneger).

Family PROCTOTRYPIDÆ.

(3) *Zygota americana* Ashmead. Monogr. N. A. Proctotrypidæ, 1893, p. 373.

Bering Island. One male, July 1897 (Mr. Barrett-Hamilton). This species was originally described from a specimen taken at Ottawa, Canada, by Mr. W. H. Harrington.

Family ICHNEUMONIDÆ.

(4) *Mesochorus frontalis*, new species.

Male.—Length, 2.5 mm. Polished black; head below antennæ, lower half of temples, the cheeks, mandibles, except tips, palpi, anterior and middle coxæ and trochanters with their tarsi more or less, the hind coxæ at tips and their trochanters, tibial spurs, tegulæ, median vein at base, and the suture between the second and third abdominal segments, white; first three joints of antennæ and legs reddish-yellow. Wings hyaline, strongly iridescent, the stigma and veins brown. Metathorax areolated, the surface shining, but microscopically wrinkled.

Type.—No. 4037, U. S. N. M.

Bering Island. One male, July, 1897 (Mr. Barrett-Hamilton).

(5) *Catastenus trifasciatus*, new species.

Female.—Length, 4 mm.; ovipositor as long as the petiole. Black, shining; mandibles and legs, except hind coxæ and femora which are black, rufous; palpi and tegulæ yellowish-white; antennæ brown-black, 24-jointed, with the first four or five joints ferruginous; abdomen black, with the apices of the second, third, and fourth segments margined with red. The eyes are large and converge below on to the clypeus, so that they are much wider from each other above than below; the face and clypeus are minutely punctate, the temples and cheeks smooth, unpunctured; thorax polished, the parapsidal furrows distinct; scutellum convex; while the metathorax is coriaceous, subopaque, and completely areolated, the areola oblong, nearly two and a half times longer than wide. Wings hyaline, strongly iridescent, somewhat obscured by the fine pubescence which covers them, the stigma and veins brown, the areolet wanting or open behind; the transverse cubitus is short, only about two-thirds the length of the first abscissa of the cubitus. Abdomen, except segments one and two, which are shagreened and opaque, smooth and shining.

Type.—No. 4038, U. S. N. M.

Bering Island. One female, July, 1897 (Dr. Stejneger).

(6) *Mesoleius stejnegeri*, new species.

Female.—Length, 6.5 mm. Black, subopaque, very finely, uniformly coriaceous; clypeus, mandibles, except teeth, and the palpi, white, tinged with brown; tegulæ white; legs fulvous, all coxae, the apical half of hind tibiæ and their tarsi, black; basal joint of all trochanters, more or less, and the two last joints of middle tarsi, fuscous or blackish. The head is transverse, with the temples rather broad, nearly as broad as the width of the eyes. Ocelli red. Antennæ 39-jointed, longer than the body, brown-black, the flagellum very gradually tapering toward apex. Thorax without distinct parapsidal furrows, at the most only vaguely defined anteriorly for about one-third the length of the mesonotum. Metathorax nearly exareolated, with only the petiolar area distinct, the spiracles round. Abdomen sessile, hardly longer than the head and thorax united, the first segment long, trapezoidal, almost twice as wide at apex as at base, without carinæ, but with a vaguely defined median sulcus extending to about two-thirds its length, the spiracles placed at the basal one-third. Wings hyaline, without an areolet, the stigma and veins, except the costal veins toward base, brown-black; first abscissa of cubitus much longer than the transverse cubital vein; transverse median nervure joining the disco cubital cell a little beyond the base of the basal nervure.

Type.—No. 3651, U. S. N. M.

Bering Island. Described from a single specimen. Accession No. 30232, taken in July, 1895, by Dr. Leonhard Stejneger, and in honor of whom the species is named.

(7) *Atmetus insularis*, new species.

Male.—Length, 4 mm. Black, shining; mandibles, palpi, tegulæ, and wing veins at base, anterior and middle coxæ at apex and their trochanters as well as the hind trochanters, their tibiæ at base, tibial spurs and base of tarsi, white; antennæ black above but beneath for two-thirds their length pale, frontal elevation at apex margined with white; legs pale ferruginous, knees of anterior and middle pairs and base of their tibiæ whitish; middle and hind coxæ and hind femora black; middle tarsi, hind tibiæ and tarsi, except as already noted, fuscous. Wings hyaline, the stigma and veins dark brown, the areolet very large, pentagonal. Abdomen long, linear, much longer than the head and thorax united, above black, but with the extreme apical margins of the second, third, and fourth segments piceous, scarcely noticeable except when viewed from behind; the first, second, and base of third segments are longitudinally striated or aciculated, the second and third segments with oblique lateral depressions at base, those on the second being connected with a transverse depressed line at its apical third and leaving a subconvex median elevation toward the base, between it and the basal lateral depressions, the apex of the third segment and the following segments are polished and impunctate; beneath, except the base of the first segment and the three apical segments, white.

Type.—No. 4039, U. S. N. M.

Copper Island. One male, August, 1897 (Mr. Barrett-Hamilton).

(8) *Stenomacrus borealis*, new species.

Female.—Length, 2.75 mm. Polished black; extreme tip of clypeus, mandibles, except teeth, basal one-third or more of antennæ, and legs, except hereafter noted, ferruginous; anterior and middle coxæ at apex, trochanters, knees, and hind trochanters yellowish white; middle coxæ at base dusky, hind coxæ black, the femora brownish piceous; tegulæ and wing veins at base white. Face prominent, finely, minutely punctured, with some fine transverse aciculations over them; antennæ 22-jointed; wings hyaline. The narrow, lanceolate stigma and the veins, except as already noted, pale brown. Metathorax rather long, finely rugulose, with four longitudinal carinæ, the two middle ones rather close together, but converging and meeting in a point at base; petiolar area distinct. Abdomen a little longer than the head and thorax united, compressed from second segment, polished, shining, but with the first entirely, and the second segment at base, aciculated.

Type.—No. 4040, U. S. N. M.

Bering Island. One female, July, 1897 (Dr. Stejneger).

(9) *Exolytus niger*, new species.

Female.—Length, 7 mm. Polished black; mandibles, palpi, and legs, except all coxæ, middle tarsi, and hind trochanters, their femora and tarsi, rufous; usually the first joint of anterior and middle trochanters and the middle femora are obfuscate or piceous, while a single specimen has the legs, except hind coxæ, their tarsi and the middle tarsi, entirely rufous, the anterior and middle coxæ being blackish only at base. Face sparsely punctate. Antennæ 21-jointed, longer than head and thorax united, the scape black, the pedicel and pedicellus rufous or piceous, while the flagellum is brown black, rarely distinctly black. Wings dusky hyaline, the stigma and costal vein brown black, the internal veins dark brown, the areolet pentagonal, complete, but the outer nervure is hyaline from a large *bulla.*

Type.—No. 4041, U. S. N. M.

Bering Island, July–August, 1897 (Dr. Stejneger). Described from three specimens taken on Bering Island and three additional specimens taken by Mr. F. A. Lucas on Pribilof Islands. One of the latter measures only 6 mm. in length.

(10) *Stibeutes nigrita*, new species.

Female.—Length, 2 mm.; ovipositor about two-thirds the length of hind tarsi. Polished black; labium and labial palpi white; maxillary palpi dusky; legs ferruginous, the coxæ black, the femora more or less embrowned; tegulæ brown.

The head is transverse, the vertex and occiput smooth, shining, impunctate, the face punctured, the clypeus well separated, convex. Antennæ 19-jointed, a little longer than the body, slightly thickened toward tips and, except a pale annulus between the pedicel and the first flagellar joint, entirely black; the scape and the pedicel are considerably stouter than the flagellum, subglobose; the first joint of the flagellum is the longest and about as long as the scape and pedicel united; the following joints to the last gradually but imperceptibly become shorter and shorter, but also gradually widen, the penultimate joint being scarcely longer than wide; the last joint is ovate, much longer than the preceding joint. Thorax without distinct parapsidal furrows, at the most only slightly indicated at the anterior margin of the mesonotum; scutellum distinct, with a transverse fovea at base; metathorax completely areolated. Wings abbreviated and narrowed, hardly extending beyond the middle of the abdomen, subhyaline; the stigma and veins brown, the areolet and marginal cell wanting. Abdomen a little longer than the head and thorax united, smooth and polished, except the petiole, which is subopaque and aciculated and as long as the second and third segments united, the spiracles placed beyond the middle; fourth segment shorter than the third, the following still shorter; the tip of the abdomen is subcompressed.

Type.—No. 3650, U. S. N. M.

Copper Island. Described from a single specimen, accession No. 30232, taken by Dr. L. Stejneger August, 1895.

(11) *Hedylus crassicornis*, new species.

Female.—Length, 3.75 mm. Black, shining; mandibles, legs, except coxæ which are black, and the hind femora which are fuscous, pale ferruginous; palpi and tegulæ yellowish white. Antennæ 18-jointed, rather stout, subclavate, the scape black, the pedicel and flagellum brown. Metathorax completely areolated, rather short, the posterior angles somewhat acute, the areola hexagonal, a little wider than long. Wings hyaline, the stigma and veins brown, the areolet very large, pentagonal, the sides composed of the first and second transverse cubiti equal but considerably shorter than the other three sides, base of third discoidal cell as wide as the base of second; hind wings with the transverse median nervure straight, not broken. Abdomen, except base of second segment, black; the body of abdomen is oval, polished, impunctate; the petiole long, with the basal two thirds striate, the apex impunctate; the second segment at base is red, while the venter is more or less yellowish or white; ovipositor as long as the petiole.

Type.—No. 4043, U. S. N. M.

Bering Island, July, 1897 (Mr. Barrett-Hamilton).

(12) *Bachia nigra*, new species.

Female.—Length, 4 mm. Robust, wholly black, except tips of anterior femora, their tibiæ and tarsi, middle tibiæ, and more or less of hind tibiæ. Head large quadrate, very sparsely, minutely punctate. Antennæ 18-jointed, flagellar joints 1–3 clavate, truncate at tips, the fourth oblong, the following to last quadrate not or scarcely longer than wide. Thorax above flattened, the scutellum flat, with a furrow across the base, the bottom of which is delicately crenated; metathorax long, rugulose, and completely areolated. Wings dusky hyaline, the stigma and veins dark brown, the areolet large, the first transverse cubitus fully as long or a little longer than the second abscissa of radius; transverse median nervure in hind wings broken far below the middle. Abdomen long ovate, depressed, as long as the head and thorax united or a little longer, the petiole being rather short and broad, subopaque, rest of abdomen smooth, shining; ovipositor short, but distinctly projecting beyond the tip of abdomen.

Type.—No. 4044, U. S. N. M.

Bering Island, July, 1897 (Mr. Barrett-Hamilton).

Order RHYNCHOTA.

(By William H. Ashmead.)

Suborder I. HOMOPTERA.

Family FULGORIDÆ.

(1) *Delphax stejnegeri*, new species.

Brachypterous form. Female.—Length, 2.5 mm. Pale yellowish, probably greenish yellow in life, the abdomen at suture of segments and beneath more or less white; ventral segments toward base and sides of labrum brownish; eyes brown-black. Face tricarinate, the median carina split on vertex and forming a triangular inclosure for the front ocellus, the lateral extend along the sides of the eyes backwards to the occiput, but connected by an oblique carina with the hind angles of the triangular inclosing. Antennæ with the second joint about twice as long as the first, dilated and with about twelve cushion-like sensoria arranged in three rows; the third joint, which is very minute and black, ends in a long black bristle. Pronotum and mesonotum with three carinæ, the hind margin of the former obtusely triangularly emarginate, of the latter triangularly produced. Tegmina not quite extending to tip of abdomen, pale immaculate, but with minute delicate punctures along the nervures. Abdomen large, oval, the apical margins of the segments whitish; terminal ventral segments deeply, roundedly emarginated at base and deeply sinuated beyond at sides; sheaths of ovipositor black, as long or a little longer than the hind femora.

Type.—No. 4046, U. S. N. M.

Bering Island, August, 1897 (Dr. Stejneger).

Suborder II. HEMIPTERA.

Family CAPSIDÆ.

(2) *Irbisia sericans* Stal. Stett. Ent. Zeit., 1838, p. 188, 64. Sahlberg, Vega Exp. Vet. Arb., p. 68.

Copper Island, August, 1895 (Mr. Barrett-Hamilton); August, 1897 (Mr. Barrett-Hamilton).

Family CORISIDÆ.

(3) *Corisa germarii* Fieber. Species Generis Corisa, 1851, p. 38.

Bering Island, 1882 (Dr. Stejneger).

Order DIPTERA.

(By D. W. Coquillett.)

Family CECIDOMYIDÆ.

(1) A single specimen, too much damaged for a more definite identification.

Bering Island, July–August, 1897 (Dr. Stejneger).

Family CHIRONOMIDÆ.

(2) A badly mutilated specimen, too much injured for even a generic identification.

Bering Island. Collected in July–August, 1897, by Dr. L. Stejneger.

EUTANYPUS, new genus.

Closely related to Tanypus, but the antennæ of the female are 8-jointed, of the male 9-jointed, not plumose, the first joint bulbous, about three times as broad as the second; joints two to seven in the female, two to eight in the male, decreasing in length outwardly, the penultimate joint only slightly longer than broad, the ultimate nearly as long as the three preceding joints; eyes deeply emarginate next the antennæ, palpi 4-jointed. Third vein of the wings simple, the fourth issuing from the fifth near its base and forking near the middle of the wing, the fifth also forking near the middle of the wing, its upper branch connected with the fourth by a crossvein; small crossvein and first section of the third vein scarcely longer than broad.

Type of genus, the following species:

(3) ***Eutanypus borealis***, new species.

Female.—Head black, opaque gray pruinose, the antennæ, palpi, and proboscis brownish black, the antennæ nearly twice as long as the head. Thorax, scutellum, and abdomen black, opaque gray pruinose, the sparse hairs chiefly yellow. Wings one and one-half times as long as the abdomen, whitish hyaline, veins yellow or brownish, the third except at its base, the fourth before its point of furcation, also its posterior branch, both branches of the fifth and the whole of the sixth almost colorless; the crossvein at the outer end of the second basal cell unites with the upper branch of the fifth a short distance beyond its base, and with the fourth a short distance before its furcation; the small crossvein at about twice the length of the outer crossvein beyond the base of the upper branch of the third vein; the first vein extends to the last fifth of the length of the wing. Legs brownish-black, first joint of the front and hind tarsi two-thirds as long as their tibiæ, the fourth joint noticeably widened, about three-fourths as long as the fifth; tarsal claws simple and of an equal length. Halteres yellow. Length, 3.5 mm.

Type.—No. 4047, U. S. N. M.

Bering Island, July–August, 1897, collected by Dr. L. Stejneger.

An immature male specimen, collected at the same time and place, differs from the female in having the palpi, antennæ, scutellum, and legs yellow. A female specimen collected on the summit of Mount Washington, New Hampshire, by Mrs. Annie T. Slosson, and kindly presented to the writer, I am unable to distinguish from the female above described.

Family CULICIDÆ.

(4) *Culex* sp.

Eight female specimens from Bering Island, July–August, 1897, collected by Mr. Barrett-Hamilton; a single specimen from Copper Island, August, 1897, taken by the same collector, and four specimens from the latter island collected by Dr. Stejneger in August, 1896. All of these specimens are abraded and not in a fit condition for identification.

Family MYCETOPHILIDÆ.

(5) *Neoglaphyroptera beringensis*, new species.

Female.—Head black, opaque gray pruinose, antennæ blackish brown, the second joint yellow, proboscis blackish brown, palpi yellow; thorax, scutellum, and abdomen black, the hairs yellow, mesonotum marked with three black vittæ, posterior margins of the abdominal segments two to six, and the genitalia yellow. Coxæ, femora, and tibiæ yellow, the trochanters black; tarsi, except at the base, brownish black. Wings hyaline, the costal cell yellowish, veins yellow, the basal third of the posterior branch of the fourth vein colorless; tip of the auxiliary vein slightly before the small crossvein, subcostal crossvein a short distance before the middle of the auxiliary vein—fourth and fifth veins forking slightly before the small crossvein, the forking of the fourth more proximal than that of the fifth; sixth vein extending a short distance beyond the forking of the fifth. Halteres yellow. Length, 4.5 mm.

Type—No. 4048, U. S. N. M.

A single specimen collected on Bering Island, July–August, 1897, by Mr. Barrett-Hamilton.

(6) *Sciara* sp.

Seven females from Bering Island, July–August, 1897, collected by Dr. Stejneger. Quite impossible to identify the species in the present condition of this genus.

Family TIPULIDÆ.

(7) *Limnophila fulvocostalis*, new species.

Female.—Head black, opaque gray pruinose, palpi brown, antennæ sixteen-jointed, nearly as long as the thorax, the first two joints black, the others yellow. Thorax black, thinly gray pruinose, a median vitta and the lateral margins yellow; pleura brown, irregularly marked with yellow; scutellum yellow, metanotum brown, the lateral and posterior margins yellow. Abdomen brownish-black, the middle of the venter and the genitalia yellow. Legs yellow, the apices of the tarsi brown. Wings hyaline, costal cell yellowish brown, the stigma darker brown; auxiliary vein ending in the first opposite the base of the second submarginal cell, and a short distance before its tip connected with the costa by a crossvein; marginal crossvein scarcely apparent; petiole of first submarginal cell slightly shorter than the hind crossvein, base of second submarginal cell considerably proximal to the base of the first posterior, petiole of second posterior cell slightly longer than that cell, hind crossvein at the middle of the discal cell. Halteres yellow, the apex of the knob brown. Length, 10 mm.

Type.—No. 4049, U. S. N. M.

Bering Island. A single specimen, collected in July–August, 1897, by Mr. Barrett-Hamilton.

(8) *Idioplasta?* sp.

A single specimen too much damaged for identification.

Copper Island, August, 1897. Collected by Mr. Barrett-Hamilton.

Family BIBIONIDÆ.

(9) *Bibio fumidus*, new species.

Male.—Black, polished, the femora and tibiæ reddish brown or blackish brown, bases of the tibiæ, of the hind femora, and of the first one or two joints of the tarsi yellow; hairs of the head black or brown, those of the body pale yellow, of the legs chiefly pale yellow. Wings pale brown, the stigma brownish black, first vein brown, the others yellow, small crossvein slightly shorter than the first segment of the third vein. Front femora greatly thickened, hind femora and tibiæ greatly dilated on the apical half, hind tarsi noticeably thickened.

Female.—Differs from the male as follows: Thorax reddish brown, mottled with dark brown, abdomen brownish yellow; coxæ, femora, tibiæ, and bases of the first two tarsal joints yellow; hairs of the head chiefly yellow. Length, 8 to 9 mm.

Type.—No. 4050, U. S. N. M.

Copper Island. Five males and one female, collected in August, 1897, by Mr. Barrett-Hamilton.

Family EMPIDIDÆ.

(10) *Empis laniventris* Eschscholtz. Entomographien, I, 1822, p. 113.

Five male specimens. Bering and Copper Islands, July–August, 1897. Collected by Mr. Barrett-Hamilton. This species was originally described from Unalaska, Fox Islands.

(11) *Tachydromia nubifera*, new species.

Male and female.—Black, the bases of the halteres yellow; hairs and bristles black; head and thorax subopaque, gray pruinose. Third joint of antennæ oval, only slightly longer than the second. Wings grayish hyaline, the costal portion beyond the base of the submarginal cell, extending from the costa to the fourth vein, brown, the limits not sharply defined; second basal cell slightly shorter than the first, anal cell wholly wanting. Front femora only slightly thicker than the others. Length, 3 to 4 mm.

Type.—No. 4051, U. S. N. M.

Bering Island. One male and two females collected in July–August, 1897, by Dr. L. Stejneger.

Family DOLICHOPODIDÆ.

(12) *Hydrophorus signiferus*, new species.

Female.—Upper part of the occiput, front and face opaque, densely brownish-yellow pruinose, a small gray spot below each of the facial tubercles; palpi brownish-yellow pruinose in the center, the edges gray; proboscis and antennæ black, third joint of the latter subquadrate, slightly broader than long, a notch at insertion of the arista and another opposite it on the lower side of the joint; penultimate joint of arista one-half as long as the last joint; bristles of occiput black, intermixed with a few pale yellow hairs. Thorax blackish, the margins and upper part of the pleura opaque, densely brownish-yellow pruinose (the center of the dorsum may have been abraded in the single specimen before me), remainder of pleura white pruinose; scutellum opaque, densely brownish-yellow pruinose, bearing four bristles. Abdomen shining bronze green, the lateral margins and venter white pruinose. Coxæ and trochanters densely whitish pruinose, femora and tibiæ shining, bronze green, the tarsi black; front femora bearing a few short spines on the basal third of the under side. Wings grayish-hyaline, veins bordered with pale brown, a dark brown spot on the hind cross-vein and another near the middle of the last section of the fourth vein; third vein toward its apex strongly curving toward the fourth; hairs of lower calypteres pale yellow. Halteres yellowish, the knobs brown. Length, 6 mm.

Type.—No. 4052, U.S.N.M.

Bering Island, July–August, 1897. A single specimen collected by Mr. Barrett-Hamilton.

Family PHORIDÆ.

(13) *Phora* sp.

Bering Island, July–August, 1897. A single specimen collected by Dr. L. Stejneger, too much damaged for identification.

Family SARCOPHAGIDÆ.

(14) *Cynomyia mortuorum* Linnæus. Fauna Suecica, 1761, p. 1830.

Bering Island, July–August, 1897. A male specimen collected by Dr. L. Stejneger. It agrees very well with a specimen from England in the National Museum.

Family MUSCIDÆ.

(15) *Calliphora erythrocephala* Meigen. Syst. Besch. Eur. Zweif. Insekten, V, 1826, p. 62.

Copper Island. A female specimen collected in August, 1897, by Mr. Barrett-Hamilton. Agrees in all respects with specimens from the United States and England.

Family ANTHOMYIIDÆ.

(16) *Limnophora compuncta* Wied. Zool. Magazine, I, 1817, p. 80.

Bering Island, July–August, 1897. Two males collected by Mr. Barrett-Hamilton.

(17) *Phorbia* sp.

Copper Island. One male and three females collected in August, 1897 by Mr. Barrett-Hamilton.

(18) *Fucellia fucorum* Fallen. Dipt. Sueciæ, Scatomyzidæ, 1819, p. 5.

Three males and one female, collected in July–August, 1897, by Mr. Barrett-Hamilton.

Family SCATOPHAGIDÆ.

(19) *Scatophaga stercoraria* Linnæus. Fauna Suecica, 1763, p. 1861.

Copper Island. Three males collected in August, 1897, by Mr. Barrett-Hamilton. Specimens were also taken on Copper and Bering islands by Dr. Stejneger in 1882 and 1883. A nearly cosmopolitan species.

(20) *Scatophaga islandica* Becker. Berl. Ent. Zeit., May, 1894, p. 175.

Copper Island. Two males and five females collected by Mr. Barrett-Hamilton in August, 1897. Described from Labrador and Iceland.

(21) *Scatophaga dasythrix* Becker. Loc. cit., p. 173.

Bering Island. A male specimen collected by Mr. Barrett-Hamilton in July-August, 1897. Originally described from Bering Straits.

(22) *Scatophaga intermedia* Walker. List Dipt. Brit. Museum, Part IV, 1849, p. 980.

Bering Island. A female specimen taken with the preceding species. Described from Nova Scotia.

Family HELOMYZIDÆ.

(23) *Leria tristis* Loew. Berl. Ent. Zeit., 1862, p. 225.

Bering Island, collected in July-August, 1897, by Dr. L. Stejneger. Copper Island, collected in August, 1897, by Mr. Barrett-Hamilton. Three males and two females. Originally described from Lake Winnipeg, British America.

Family PHYCODROMIDÆ.

(24) *Coelopa frigida* Fallen. Dipt. Sueciæ, Hydromyzidæ, 1823, p. 6.

Copper Island in August and Bering Island in July-August, 1897. Ten specimens collected by Mr. Barrett-Hamilton. Dr. Stejneger also took specimens on Bering Island in 1882-83. The species is nearly cosmopolitan in the Northern Hemisphere.

Family TRYPETIDÆ.

(25) *Trypeta flaveola*, new species.

Female.—Yellow, an ocellar dot, two spots on the metanotum, and the first segment of the ovipositor black; bristles and hairs also black; third antennal joint rounded at the apex, arista bare, proboscis robust, not geniculate. Thorax destitute of medio dorsal bristles in front of the suture, one sternopleural bristle, scutellum bearing four marginal ones. Ovipositor only slightly flattened, the first segment slightly longer than the sixth abdominal segment. Wings hyaline, a black spot filling the space between the ends of the auxiliary and first veins, a fascia extending from base of submarginal cell to lower outer angle of the anal, a spot near middle of the penultimate section of the fifth vein, a large spot covering the hind crossvein and extending to the hind margin of the wing, finally a black border along the apex of the wing, extending from a short distance beyond the tip of the first vein to a short distance beyond the apex of the fourth; small crossvein faintly clouded with brown; first and third veins bristly, lower outer angle of anal cell prolonged in a point. Length 5.5 mm.

Type.—No. 4053, U. S. N. M.

Bering Island. A single specimen collected in July-August, 1897, by Dr. L. Stejneger. Belongs to the genus Trypeta as restricted by Schiner and Loew.

Family EPHYDRIDÆ.

(26) *Ephydra* sp.

Copper Island. A single damaged specimen collected in August, 1897, by Mr. Barrett-Hamilton.

Family BORBORIDÆ.

(27) *Borborus* sp.

Glinka, Copper Island. A single specimen collected August 23, 1897, by Dr. L. Stejneger. Too much injured for a more definite identification.

Family HIPPOBOSCIDÆ.

(28) *Ornithomyia butalis*, new species.

Front of head black, two contiguous spots on the vertex and the anterior half of the orbits, yellow; frontal lunule and antennæ yellow, bases of the latter and a spot below the lunule, black; under part of the head and the eyes yellow, middle of occiput black; thorax shining black, destitute of a longitudinal sulcus in the middle, the sides on the anterior half mottled yellow and brown; pleura on the anterior half black, the posterior part brown, the two colors separated by an oblique yellow stripe; scutellum black, distinctly sulcate longitudinally in the middle, the posterior margin convex, the base yellow, this color not extending to the outer angles; sternum in the middle, and the coxæ yellow; legs yellow, a vitta on upper side of the front femora, apical half of the middle and hind femora, and a vitta on the outer and inner sides of the middle and hind tibiæ, brown; front tarsi yellow, middle and hind ones brown, all claws black; wings hyaline, first three veins and the costa to tip of the third vein except on its basal fourth, also the fourth vein to the small crossvein, and the fifth to slightly beyond apex of second basal cell, black; veins elsewhere yellowish; crossveins at apices of the second basal and anal cells present and distinct. Length, 4 mm.

Type.—No. 1389, U. S. N. M.

Bering Island, on *Butalis sibirica*. A single specimen collected June 8, 1883, by Dr. L. Stejneger.

Order SIPHONAPTERA.

(By D. W. Coquillett.)

Family PULICIDÆ.

Pulex fasciatus Bosc. Bull. Soc. Philomat., 1801, p. 156.

Bering Island. Taken by Dr. Stejneger in 1882–83.

Order PLECOPTERA.

(By Nathan Banks.)

Family PERLIDÆ.

Chloroperla severa Hagen. Neuropt. N. Amer., p. 30.

One specimen from Bering Island, July–August, 1897 (Stejneger.)

Order TRICHOPTERA.

(By Nathan Banks.)

Family PHRYGANEIDÆ.

(1) *Limnophilus perjurus* Hagen. Neuropt. N. Amer., p. 258.

Two specimens from Bering Island, July–August, 1897 (Stejneger and Barrett-Hamilton).

7, by Mr.

y Dr. L.

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f occiput
the sides
lack, the
cutellum
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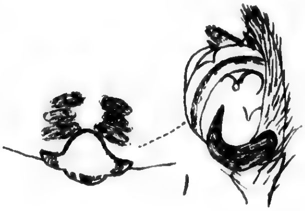
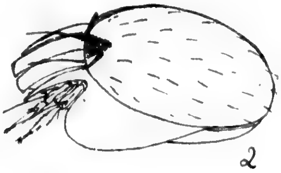
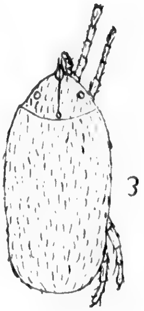
h, 4 mm.

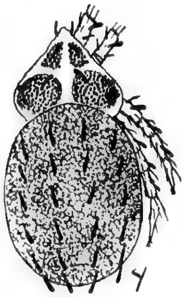
1883, by

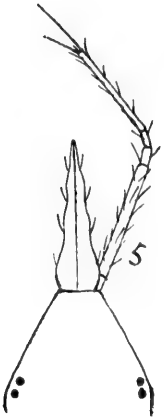
Barrett-

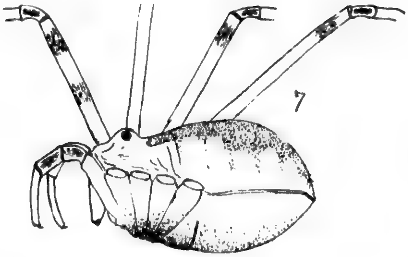












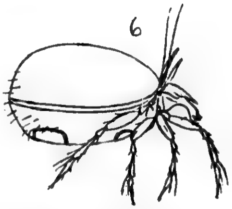


FIG. 1. *Gonglydium borealis*, epigynum and palpus.
FIG. 2. *Oribatella borealis*, dorso-lateral view.
FIG. 3. *Rhyncolophus elongatus*, dorsal view.
FIG. 4. *Hermannia quadriseriata*, dorsal view.

FIG. 5. *Bdella frigida*, head and palpus.
FIG. 6. *Oppia arctica*, lateral view.
FIG. 7. *Leptobunus borealis*, side view.

NEW COMMANDER ISLAND ARACHNIDA.

Drawn by Nathan Banks.

(2) *Goniotaulius femoralis* Kirby. Fauna Bor. Amer., p. 253.

Two specimens, one from Bering Island, July–August, 1897 (Stejneger), and the other from Copper Island, August, 1897 (Barrett-Hamilton).

Besides the above there are three young forms—one of a Perlid, one of an Ephemerid, and one of a Caddice-fly; none of these can be more definitely determined.

ARACHNIDA.

(By Nathan Banks.)

Order ARANEIDA.

Family THERIDIDÆ.

(1) *Bathyphantes pogonias* Kulczynski. Pajaki zebrane na Kamczatce, 1885, p. 32.

Several specimens from Bering Island, July–August, 1897 (Mr. Barrett-Hamilton).

(2) *Bathyphantes arctica* Keyserling. Die Spinn. Amer. Theridida, II, p. 85.

One specimen from Copper Island, August, 1897 (Mr. Barrett-Hamilton).

(3) *Microneta ululabilis* Keyserling.

Erigone ululabilis Keys., Die Spinn. Amer. Theridida, II, p. 184.

Several specimens of both sexes from Copper Island, August, 1897 (Mr. Barrett-Hamilton).

(4) *Gonglydium borealis*, new species. Plate A, fig. 1.

Cephalothorax, mandibles, legs, and sternum pale yellowish brown, the mandibles rather darker, and the sternum a little paler; abdomen whitish or pale gray above and below, the epigynum reddish, legs rather darker at the tips. Cephalothorax quite broad in front, highest a little behind the eyes; hind row procurved, the P. M. E. small, more than their diameter apart, fully three times as far from the larger S. E.; A. M. E. small, scarcely their diameter apart, quadrangle of M. E. much higher than broad, wider above than below; mandibles quite long, sternum subtriangular, a little longer than broad; legs moderately long and slender, with many hairs, and a few scattered spines; abdomen about one and one-half times as long as broad, somewhat truncate at base, blunt pointed at the tip; epigynum shows a transverse ridge, broadly indented in the middle and showing basad each side a dark mark; male palpus rather short, tibia simple, palpal organ not very large nor complicated, with a dark curved hook at base, one end blunt, the other pointed, tip of bulb with a whitish pointed sheath, finely roughened, and supporting the fine tip of the style. Length, 2 mm.

Type.—No. 4054, U. S. N. M.

Two specimens, male and female, from Copper Island, August, 1897 (Mr. Barrett-Hamilton).

(5) *Erigone* sp.

Two specimens, females, from Bering Island, July–August, 1897 (Mr. Barrett-Hamilton). Quite small and black, except pale legs and palpi. Possibly they belong to some species described only from the male.

(6) *Erigone* sp.

One specimen, female, from Bering Island, July–August, 1897 (Mr. Barrett-Hamilton). Dark, except pale legs.

Family LYCOSIDÆ.

(7) *Pardosa* sp.

Two males from Bering Island, July–August (L. Stejneger), with black cephalothorax, abdomen, sternum, and palpi; legs pale yellowish, coxæ black above, and basal part of femora I and II black, and with line above, as also on femora III and IV. Many of the species liable to occur in this region are known only from females; thus it is impossible to tell whether this species is new or not.

Order ACARINA.

Family RHYNCOLOPHIDÆ.

(8) *Rhyncolophus elongatus*, new species. Plate A, fig. 3.

Red. Abdomen fully twice as long as broad, slightly constricted at the third legs, broadly rounded at the tip; cephalothorax quite distinctly separated from the abdomen, triangular, with a median dorsal groove, enlarged at tip, with a large eye each side; body rather scantily clothed with short, curved, stiff hairs; fore legs scarcely as long as the body is broad, hind legs widely separated from the fore pair, the fourth pair only a trifle longer than breadth of the body, last joint of leg I a little shorter than the preceding joint, somewhat enlarged, legs clothed with hairs like those of the body. Length, 1.8 mm.

Type.—No. 4055, U. S. N. M.

Several specimens from Bering Island, July–August, 1897 (Mr. Barrett-Hamilton and Dr. Stejneger). By the elongate body, short legs, and small size it differs from any described species of boreal Rhyncolophus.

Family TROMBIDIDÆ.

(9) *Trombidium armatum* Kramer and Neumann. Acariden wahrend der Vega Expedition eingesammelt, p. 521.

One specimen from Copper Island, August, 1897 (Mr. Barrett-Hamilton). Probably belongs here. Described from St. Lawrence Bay.

Family BDELLIDÆ.

(10) *Bdella villosa* Kramer and Neumann. Acariden wahrend der Vega Expedition eingesammelt, p. 525.

Several specimens from Bering Island, July–August, 1897 (Mr. Barrett-Hamilton); one from Glinka, Copper Island, August, 1897 (Dr. Stejneger). It was described from Bering Island.

(11) *Bdella borealis* Kramer and Neumann. Acariden wahrend der Vega Expedition eingesammelt, p. 525.

One specimen from Bering Island, July–August, 1897 (Dr. Stejneger). It was described from Grantley Harbor, on the American side of Bering Strait.

(12) *Bdella frigida*, new species. Plate A, fig. 5.

Red. The body subpyriform, broadly rounded behind, tapering in front, with a few scattered hairs above; cephalothorax triangular, two eyes each side near base; mandibles very slender and long, with about four hairs each side; palpi long, second joint not reaching to tip of mandibles, third and fourth short, subequal, fifth about as long as second; with two bristles at tip, the outer one being fully one-half the length of the joint, whole palpus with a few scattered hairs, rather longer than the width of the joints; legs moderately long, and with scattered hairs. Length, 1.3 mm.

Type.—No. 4056, U. S. N. M.

Several specimens from Bering Island, July–August, 1897 (Dr. Stejneger). Differs from *B. villosa* in smaller size, more slender mandibles, and in the shorter fourth joint of the palpus.

Family GAMASIDÆ.

(13) *Holostaspis arcticus* Kramer and Neumann.

Gamasus arcticus, ibid, Acariden wahrend der Vega Expedition eingesammelt, p. 528.

Several specimens from Bering Island, July–August, 1897 (Mr. Barrett-Hamilton); two from Glinka, Copper Island, August, 1897 (Dr. Stejneger). Described from Bering Island.

Family IXODIDÆ.

(14) *Ixodes borealis* Kramer and Neumann. Acariden wahrend der Vega Expedition eingesammelt, p. 526.

Several specimens from Bering Island, July–August, 1897 (Dr. Stejneger). Described from this island. *Ixodes fimbriatus*, of the same authors and from the same locality, is probably the male of this species. Dr. Stejneger also took a specimen on Toporkoff Island.

Family ORIBATIDÆ.

(15) *Oribatella borealis*, new species. Plate A, fig. 2.

Black; a pale triangular spot at base of the abdomen; wings, tectal plate, and legs yellowish. Tectal plate large, covering the whole of the cephalothorax, deeply cleft, each side truncate at tip; two superior bristles; setæ moderately short, clavate, dorsum of abdomen with a few fine short hairs (inconspicuous); wing large, in front at base with a slender, curved, acute projection, reaching forward as far as tip of the head, below the wing is rolled in, but from below shows a nearly square corner at the tip; venter smooth; the genital opening is in the form of a trapezium, more than twice its length in front of the larger anal opening; coxal plate shows only two short lines each side; legs short, the femora rather broad. Length, 0.5 mm.

Two specimens, Glinka, Copper Island, August, 1897 (Dr. Stejneger).

Type.—No. 4057, U. S. N. M.

(16) *Oppia arctica*, new species. Plate A, fig. 6.

Black; legs paler. Body rather short and broad; tectal plate free at tip, two-pointed, each with a short bristle; at base are two very long and erect superior bristles; setæ of moderate length, broadest toward tip, but the tip pointed; tectopodium of first legs large and prominent; legs rather short, with simple hairs, the femora not very broad; abdomen smooth, with a few hairs at tip above, and some on the venter toward tip; genital opening fully twice its length in front of the larger anal opening; sternal plate shows complete transverse lines. Length, 0.8 mm.

Type.—No. 4058, U. S. N. M.

One specimen from Glinka, Copper Island, August, 1897 (Dr. Stejneger).

(17) *Hermannia quadriseriata*, new species. Plate A, fig. 4.

Black; hairs white; legs red-brown. Abdomen elliptical, dorsal surface reticulate above, with four rows of six slightly clavate hairs; cephalothorax triangular, with a large, finely pitted wart each side at base, each bearing above a clavate hair, and each side the short, clavate seta; in front are two smaller warts, each bearing a clavate hair; legs short and stout, with some simple hairs, and one clavate one on most of the basal joints; venter granulate; the openings touch each other; the anal is the larger. Length, 1 mm.

Type.—No. 4059, U. S. N. M.

Two specimens from Glinka, Copper Island, August, 1897 (Dr. Stejneger). This looks much like Michael's figure of *Hermannia reticulata* Thorell, but certainly is not the species figured by Koch under the name, which, though allied, is easily separated by the longer legs, larger stigmata, etc. It differs from ***Nothrus scaber*** Koch (which is evidently a Hermannia) by the shape of the cephalothorax, shorter legs, with clavate hairs, and short clavate superior bristles.

Order PHALANGIDA.

Family PHALANGIDÆ.

(18) *Leptobunus borealis*, new species. Plate A, fig. 7.

Pale yellowish, with a broad, dark streak above, with a lateral extension on each side of the middle of the abdomen; legs pale, the tips of femora and the patellæ marked with dark, a band on middle of femora I; some specimens have dark bands on tibiæ I also, and the tarsi dark at tips; palpi pale, with dark lines on the basal joints, last joint blackish at tip. Body smooth; eye tubercle low and smooth; palpi moderately short, the tibia scarcely longer than the patella and cylindrical, the tarsus much longer than the tibia, more slender, and slightly curved; legs slender, not very long, femur I much shorter than width of body; femur II longer than the body of male, shorter than body of female; tibia I without false articulations; metatarsus I with two false articulations, and tibia II with one false articulation. Length of male, 5 mm.; female, 6 mm.; femur I, 2.9 mm.

Type.—No. 4060, U. S. N. M.

Several specimens from Bering Island, July–August, 1897 (Mr. Barrett-Hamilton); Bering Island, July–August, 1897 (Dr. Stejneger); and Copper Island, August, 1897 (Mr. Barrett-Hamilton).

MYRIAPODA.

(By Prof. O. F. Cook.)

Order EPIMORPHA.

Family LINOTAENIIDÆ.

(1) *Linotaenia chionophila* (Wood).

Strigamia chionophila Wood, Journ. Phil. Acad. Sci., V, 1862, p. 50. Wood, Trans. Am. Phil. Soc., XIII, 1865, p. 189.

Scolioplanes chionophilus Meinert, Proc. Am. Phil. Soc., XXI, 1885, p. 223.

Linotaenia chionophila Bollman, Bull. 46, U. S. N. M., 1893, p. 123.

Bering Island, Glinka (Dr. Stejneger), Copper Island (Mr. Barrett-Hamilton), July and August, 1897.

Males with 43 legs and females with 45 occur among the numerous specimens, which seem to differ in no other respect from eastern examples of *chionophila;* 43 legs in females and 41 in males are the largest numbers previously reported.

Order ANAMORPHA.

Family LITHOBIIDÆ.

(2) *Lithobius stejnegeri* Bollman. Bull. 46, U. S. N. M., 1893, p. 199.

Bering Island, July–August, 1897 (Dr. Stejneger, Mr. Barrett-Hamilton); Copper Island, August, 1897 (Mr. Barrett-Hamilton).

This species belongs to the subgenus *Archilithobius* and seems to have not very distant relatives among several species described from Siberia by Stuxberg. This larger suite of specimens shows considerable variation in color, some individuals being quite deep purplish red, while others are rather light brownish. Females of both colors were examined and the shape of the genital forceps seemed to be identical.

(3) *Lithobius sulcipes* Stuxberg. Öfv. Iet.-Akad, Forh. 21. Bollman, Bull. No. 46, p. 199.

Bering Island. Taken in 1883 by Dr. Stejneger.

II.—LIST OF PLANTS COLLECTED BY DR. AND MRS. LEONHARD STEJNEGER ON THE COMMANDER ISLANDS DURING 1895 AND 1897.

By Frederick V. Coville and J. N. Rose.

Of the various botanical collections known to have been made on the Commander Islands, those of Georg Wilhelm Steller, 1741–42, Benedict Dybowski, 1879, and Julian Wiemuth, 1879, are deposited at St. Petersburg, Russia; those of Frans Reinhold Kjellman, 1879, and Ernst Almquist, 1879, at Stockholm, Sweden; those of James M. Macoun, 1891, at Ottawa, Canada; and those of Leonhard Stejneger, 1882–1897, and Nicolai Björkquist, 1882, in the United States National Herbarium at Washington. Desirable as is a complete list of all the plants known from these islands, it has been impracticable, on account of the wide separation of the various collections, to give a properly digested account of them with critical identifications of all the species. The present paper, therefore, has been confined to an enumeration of those plants collected by Dr. Stejneger of which no report has yet been published.

Most of the information relative to the flowering plants of the Commander Islands heretofore published is to be found in two papers by Dr. Asa Gray and Dr. Stejneger, issued in 1885,[1] another by Dr. Kjellman in 1887,[2] and a third by Dr. George Vasey in the same year.[3]

The Commander Islands bear no trees, the fuel customarily used being driftwood from the mainland. To the violent wet winds that sweep over the islands in winter is doubtless to be attributed this absence of arboreal vegetation, for the conditions of temperature and humidity are such as to render probable the occurrence of trees under otherwise suitable conditions. The geographic relationship of the flora, originally pointed out by Steller and afterwards more critically investigated by Kjellman, is primarily Kamchatkan, with strong Aleutian and Arctic elements. To this evident triple derivation can be added almost no insular specialization, for the islands are the type locality of but two species, *Cassiope oxycoccoides* Gray and *Alopecurus stejnegeri* Vasey, neither of which is by any means certainly confined to these islands.

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[1] Gray, Asa. Notes upon the plants collected on the Commander Islands (Bering and Copper islands) by Leonhard Stejneger. (In Proc. U. S. Nat. Mus., v. 7, pp. 527–529. 1885.) Stejneger, Leonhard. Additional notes on the plants of the Commander Islands. (In Proc. U. S. Nat. Mus., v. 7, pp. 529–536. 1885.)

[2] Kjellman, Frans Reinhold. Om Kommandirski-Oarnas Fanerogamflora. (In Nordenskiold A. E. Vega-Exped. Vetenskap. Iakttag., v. 4, pp. 281–309. Stockholm, 1887.)

[3] Vasey, George. Description of *Alopecurus stejnegeri*, a new species of grass from the Commander Islands. (In Proc. U. S. Nat. Mus., v. 10, p. 153. 1887.)

Of the flowering plants enumerated in the present list the following have not heretofore been reported from the Commander Islands:

Achroanthes diphyllos (Cham. & Schlecht.) Coville & Rose.
Alsine crassifolium (Ehrh.) Britton.
Cerastium maximum L.
Chrysosplenium kamtschaticum Fisch.
Euphrasia officinalis latifolium (Pursh) Britton.
Hippuris tetraphylla L. f.
Koenigia islandica L.
Lathyrus palustris L.
Listera cordata R. Br.
Medicago denticulata Willd.
Poa annua L.
Poa stenantha Trin.
Ranunculus hyperboreus Rottb.
Rhinanthus crista-galli L.
Saussurea tilesii Ledeb.
Savastana odorata (L.) Scribn.
Sparganium minimum Fries.
Trifolium repens L.

For various identifications and verifications the writers are indebted to Dr. W. G. Farlow, Dr. E. L. Greene, Prof. W. W. Rowlee, Prof. F. Lamson-Scribner, Mr. Theodor Holm, and Mr. J. M. Greenman.

CATALOGUE OF SPECIES.

CHLOROPHYCEÆ.

Chætomorpha melagonium (Web. & Mohr.) Kutzing.

Nikolski, Bering Island, August 14, 1897 (No. 164).

Codium mamillosum Harvey.

Preobrazhenskoye, Copper Island, August 18, 1897 (No. 182).

RHODOPHYCEÆ.

Ptilota asplenioides (Turn.) J. Ag.

Preobrazhenskoye, Copper Island, August 18, 1897 (No. 183).

HEPATICÆ.

Marchantia polymorpha L.

Nikolski, Bering Island, July 9, 1897 (No. 86).

MUSCI.

Mnium pseudopunctatum Bruch & Schimper.

Glinka, Copper Island, sea level, August 23, 1897 (No. 126).

SPARGANIACEÆ.

Sparganium minimum Fries.

Podutiosnaya, Bering Island, July 20, 1897 (No. 125).

GRAMINEÆ.

Savastana odorata (L.) Scribn.

Nikolski, Bering Island, July 9, 1897 (No. 87).

Alopecurus stejnegeri Vasey.

Nikolski, Bering Island, July 20, 1897 (No. 128).

Poa annua L.

Palata Rookery, Glinka, Copper Island, August 21, 1897 (No. 167).

Poa stenantha Trin.

Glinka, Copper Island, August 18, 1897 (No. 169).

CYPERACEÆ.

Carex sp.

Nikolski, Bering Island, July 9, 1897 (No. 81); and Nikolski, Bering Island, July 15, 1897 (No. 96); and at Nikolski, Bering Island, July 20, 1897 (No. 129).

Carex rariflora Smith.

Not reported from the islands before. Bering Island, July 23, 1895 (No. 7).

Carex cryptocarpa Mey.

Bering Island, July 23, 1895 (No. 6).

LILIACEÆ.

Streptopus amplexifolius (L.) DC.

Nikolski, Bering Island, July 15, 1897 (No. 105).

Maianthemum bifolium kamtschaticum Gmel.

Bering Island, July 23, 1895 (No. 30); and at Nikolski, Bering Island, July 15, 1897 (No. 92).

Fritillaria camtschatcensis (L.) Ker.

Bering Island, July 23, 1895 (No. 29).

Tofieldia calyculata Wahlenb.

Bering Island, July 23, 1895 (No. 32); and at Nikolski, Bering Island, July 15, 1897 (No. 99).

ORCHIDACEÆ:

Achroanthes diphyllos (Cham. & Schlecht.) Coville & Rose.
Microstylis diphyllos (Cham. & Schlecht.) Lindl. Gen. et Spec. Orch. 19. 1830–40.
Malaxis diphyllos Cham. & Schlecht. Linnæa, 3:34. 1826.

The type of this species was collected in Unalaska in 1816 or 1817 and was also reported by Rothrock in 1867, but we have no specimens so named in the National Herbarium. Mr. Walter Evans collected in 1897 (No. 357) specimens from the type locality which answer in all respects the characters as given in the original description. Most writers on our northern plants have not seen the species, including Lindley, who transferred the species from *Malaxis* to *Microstylis*. This has led the compilers of the Kew Index to refer the species to *M. monophyllos*. It differs from that species in always having two leaves instead of one; these narrower, often lanceolate and somewhat acutish; slightly larger flowers, denser spikes, and longer, stouter bracts (always longer than the pedicels).

Nikolski, Bering Island, July 15, 1897 (No. 115).

Listera cordata (L.) R. Br.

Nikolski, Bering Island, July 15, 1897 (No. 101). Not reported before from Commander Islands.

Orchis aristata Fisch.

Bering Island, July 23, 1895 (No. 33); and at Nikolski, Bering Island, July 15, 1897 (No. 95).

Habenaria borealis Cham.

Bering Island, July 23, 1895 (No. 34).

SALICACEÆ.

Salix crassijulis Trautv.

Bering Island, July 23, 1895 (No. 47).

Salix diplodictya Trautv.

Bering Island, July 23, 1895 (No. 46).

URTICACEÆ.

Urtica dioica L.

Bering Island, August 20, 1895 (No. 59); and at Nikolski, Bering Island, August 8, 1897 (No. 147).

POLYGONACEÆ.

Kœnigia islandica L.

Copper Island, August 9, 1895 (No. 56); and at Preobrazhenskoye, Copper Island, August 18, 1897 (No. 171). This species has not before been reported from these islands.

Polygonum viviparum L.

Bering Island, July 23, 1895 (No. 36).

PORTULACACEÆ.

Montia sibirica (L.) Howell.

Nikolski, Bering Island, July 9, 1897 (No. 86).

CARYOPHYLLACEÆ.

Cerastium alpinum fischerianum (Ser.) Torr. & Gr.

Nikolski, Bering Island, July 15, 1897 (No. 94).

Cerastium maximum L.

This species is new to the islands. Nikolski, Bering Island, August 8, 1897 (No. 151).

Arenaria macrocarpa Pursh.

Nikolski, Bering Island, July 15, 1897 (No. 100).

Alsine crassifolia (Ehrh.) Britton.

Nikolski, Bering Island, July 16, 1897 (No. 121).

The specimen thus referred has not been reported before under this name. It may be the *Stellaria borealis* of Kjellman's list.

RANUNCULACEÆ.

Anemone narcissiflora L.

Bering Island, July 23, 1895 (No. 35).

Anemone richardsonii Hook.

Bering Island, July 23, 1895 (No. 20).

Ranunculus hyperboreus Rottb.

This species has not been reported from the islands before. Glinka, Copper Island, August 7, 1895 (No. 50).

Ranunculus eschscholtzii Schlecht.

Bering Island, July 23, 1895 (No. 19).

Ranunculus auricomus L.

Nikolski, Bering Island, July 9, 1897 (No. 82).

Ranunculus acris L.

Nikolski, Bering Island, July 9, 1897 (No. 83).

Trollius patulus Salisb.

Bering Island, July 23, 1895 (No. 14); Nikolski, Bering Island, July 15, 1897 (No. 97).

Coptis trifolia (L.) Salisb.

Bering Island, July 23, 1895 (No. 16); Nikolski, Bering Island, July 16, 1897 (No. 124).

Aconitum delphinifolium DC.

So named by Dr. Gray, but referred to *A. kamtschaticum* by Kjellman.

Nikolski, Bering Island, August 9, 1897 (No. 156).

Delphinium elatum L.

South Rookery, Bering Island, July 29, 1897 (No. 136). This identification is given on authority of Dr. Gray.

CRUCIFERÆ.

Cardamine umbellata Greene, Pittonia, 3: 154. 1897.

This is the *C. hirsuta* of Kjellman and of Gray, which species is therefore to be excluded from this flora.

Nikolski, Bering Island, July 9, 1897 (No. 79).

Draba incana L.

Bering Island, July 23, 1895 (No. 41); Nikolski, Bering Island, July 9, 1897 (No. 80).

DROSERACEÆ.

Drosera rotundifolia L.

Nikolski, Bering Island, July 20, 1897 (No. 127).

SAXIFRAGACEÆ.

Chrysosplenium kamtschaticum Fisch.

This species was collected by Dr. Stejneger in 1883, but was confused with *C. alternifolium*, which is also found here.

At Preobrazhenskoye, Copper Island, August 16, 1897 (No. 165).

Saxifraga hirculus L.

Copper Island, August 9, 1895 (No. 55).

Saxifraga nelsoniana D. Don, Trans. Lin. Soc. 13: 355. 1822.
Saxifraga punctata L. of most authors as to Northwestern plants.

Don's plant deserves to be recognized as a distinct species. It resembles *S. punctata* very much, but can easily be distinguished. *S. punctata* is glabrous throughout, except the short simple glandular hairs of the inflorescence; the inflorescence is a loose elongated panicle with numerous flowers; carpels terminated by slender styles, with small stigmas. *S. nelsoniana* has the petioles, and under surface of the leaves more or less pubescent, the scape and inflorescence villose; the hairs not single-celled or gland-tipped; the styles short and tipped with large flat stigmas. *S. punctata* L. is therefore to be excluded from the flora of these islands.

Bering Island, July 23, 1895 (No. 17); Glinka, Copper Island, August 7, 1895 (No. 53); Nikolski, Bering Island, July 9, 1897 (No. 85).

Saxifraga serpyllifolia Pursh.

Glinka, Copper Island, August 7, 1895 (No. 52).

We have no named specimens of this species in the National Herbarium, but the plant is reported by Kjellman from these islands. Here belongs the *S. chrysantha* and the form of *S. hirculus*, as named by Dr. Gray. *S. chrysantha* is, therefore, to be excluded from the islands, but *S. hirculus* was collected by Dr. Stejneger in 1885 (No. 55). The latter species does not run into *S. chrysantha*, as suggested by Dr. Gray.

ROSACEÆ.

Rubus chamæmorus L.

Bering Island, July 23, 1895 (No. 13).

Rubus stellatus Smith.

Bering Island, July 23, 1895 (No. 31).

Geum calthifolium Smith.

Bering Island, July 23, 1895 (No. 21); Nikolski, Bering Island, July 15, 1897 (No. 112).

Sibbaldia procumbens L.

Bering Island, July 23, 1895 (No. 42); Nikolski, Bering Island, July 15, 1897 (No. 116).

Potentilla fragiformis villosa (Pall.) Regel.

Bering Island, July 23, 1895 (No. 37); Nikolski, Bering Island, July 15, 1897 (No. 98).

Potentilla palustris Scop.

Nikolski, Bering Island, August 8, 1897 (No. 150).

Potentilla anserina L.

Bering Island, July 23, 1895 (No. 26); Nikolski, Bering Island, July 16, 1897 (No. 122).

Sorbus sambucifolia (Cham. & Schlecht.) Roem.

Bering Island, July 23, 1895 (No. 45).

LEGUMINOSÆ.

Medicago denticulata Willd.

Undoubtedly introduced with feed. Only a single specimen seen. Nikolski, Bering Island, July 31, 1897 (No. 139).

Trifolium repens L.

An introduced plant. Preobrazhenskoye, Copper Island, August 18, 1897 (No. 176).

Lathyrus maritimus aleuticus Greene.

This is the *L. maritimus* of Kjellman's and Gray's lists.

Nikolski, Bering Island, August 10, 1897 (No. 161); also at Nikolski, Bering Island, July 15, 1897 (No. 108).

Lathyrus palustris L.

This species is new to the islands. Nikolski, Bering Island, August 10, 1897 (No. 160).

GERANIACEÆ.

Geranium erianthum DC.

Bering Island, July 23, 1895 (No. 23); Nikolski, Bering Island, July 15, 1897 (No. 107).

VIOLACEÆ.

Viola langsdorffii Fisch.

Bering Island, July 23, 1895 (No. 40); Nikolski, Bering Island, July 15, 1897 (No. 104).

ONAGRACEÆ.

Chamænirion latifolium (L.) Sweet.

Mouth of Poludionnaya Retchka, Bering Island, July 23, 1897 (No. 132).

Epilobium bongardi Haussk.

South Rookery, Bering Island, July 29, 1897 (No. 134); and also at Nikolski, Bering Island, July 9, 1897 (No. 91).

Epilobium sp.

South Rookery, Bering Island, July 29, 1897 (No. 133); and at Nikolski, Bering Island, July 16, 1897 (No. 120).

HALORAGIDACEÆ.

Hippuris tetraphylla L. f.

H. vulgaris has been reported from the islands, but not the above species, which is very rare in collections. The only specimens which we have seen came from the Alaskan islands.

Nikolski, Bering Island, August 8, 1897 (No. 152).

Myriophyllum alternifolium DC.

Glinka, Copper Island, August 20, 1897 (No. 172).

UMBELLIFERÆ.

Ligusticum scoticum L.

Nikolski, Bering Island, August 9, 1897 (No. 153).

Selinum benthami Watson.

This is undoubtedly the *Conioselinum kamtschaticum* of Kjellman's list.

Nikolski, Bering Island, August 14, 1897 (No. 163); South Rookery, Bering Island, July 29, 1897 (No. 138).

Calopleurum gmelini (DC.) Ledeb.

This is undoubtedly the *Angelica archangelica* of Kjellman and *Archangelica officinalis* of Gray's list.

Nikolski, Bering Island, August 10, 1897 (No. 158).

Heracleum lanatum Michx.

On plate 15 will be found a view showing a large thicket of this plant.

Nikolski, Bering Island, August 9, 1897 (No. 154).

CORNACEÆ.

Cornus suecica L.

Bering Island, July 23, 1895 (No. 18); Nikolski, Bering Island, July 15, 1897 (No. 89).

PYROLACEÆ.

Pyrola minor L.

Bering Island, July 23, 1895 (No. 11), and Nikolski, Bering Island, July 20, 1897 (No. 130).

ERICACEÆ.

Oxycoccus oxycoccus (L.) MacMillan.

Bering Island, August 13, 1895 (No. 57).

Vaccinium vitis-idæa L.

Bering Island, July 23, 1895 (No. 44).

Vaccinium uliginosum L.

Bering Island, July 20, 1895 (No. 3).

Mairania alpina (L.) Desv.

Preobrazhenskoye, Copper Island, August 18, 1897 (No. 181).

Cassiope lycopodioides D. Don.

Bering Island, July 23, 1895 (No. 43).

Andromeda polifolia L.

Bering Island, July 20 and 23, 1895 (No. 5).

Loiseleuria procumbens Desf.

Bering Island, July 20, 1895 (No. 1).

Phyllodoce cærulea (L.) Bab.

Bering Island, July 20 and 23, 1895 (Nos. 4 and 27).

Bryanthus bryantha (L.) Coville & Rose.

Andromeda bryantha L. Mant. 2:238. 1767.

Bryanthus gmelini D. Don, Edinb. New Phil. Journ. 17:160. 1834.

Bering Island, August 21, 1895 (No. 61); North Saranna Lotka, Bering Island, August 8, 1897 (No. 159), and Glinka, Copper Island, August 22, 1897 (No. 162).

Ledum palustre L.

Bering Island, July 20, 1895 (No. 2).

Rhododendron chrysanthum Pall.

Bering Island, July 23, 1895 (No. 28).

Rhododendron kamtschaticum Pall.

Glinka, Copper Island, August 7, 1895 (No. 51).

PRIMULACEÆ.

Primula cuneifolia Ledeb.

Bering Island, July 23, 1895 (No. 39); Nikolski, Bering Island, July 15, 1897 (No. 103).

Trientalis europæa arctica Ledeb.

Bering Island, July 23, 1895 (No. 12); Nikolski, Bering Island, July 15, 1897 (No. 102).

GENTIANACEÆ.

Gentiana auriculata Pall.

Nikolsky, Bering Island, August 6 and 8, 1897 (Nos. 146 and 157).

POLEMONIACEÆ.

Polemonium cæruleum acutiflorum Willd.

Bering Island, July 23, 1895 (No. 22); Nikolski, Bering Island, July 15, 1897 (No. 109).

SCROPHULARIACEÆ.

Veronica serpyllifolia L.

Preobrazhenskoye, Copper Island, August 18, 1897 (No. 170).

Veronica stelleri Pall.

Mouth of Poludionnaya Retchka, Bering Island, July 23, 1897 (No. 131).

Veronica americana Schw.

Preobrazhenskoye, Copper Island, August 16, 1897 (No. 166).

Veronica kamtchatica L. f.

Glinka, Copper Island, August 7, 1895 (No. 54); at Nikolski, Bering Island, July 15, 1897 (No. 106).

Euphrasia officinalis latifolia (Pursh) Britton.

Perhaps this should be restored to specific rank. The upper leaves are not as sharply toothed and the flowers are smaller than in the typical form.

Nikolski, Bering Island, July 9, 1897 (No. 78). Collected by J. M. Macoun in 1891.

Pedicularis sudetica Willd.

Bering Island, July 23, 1895 (No. 24), and Nikolski, Bering Island, July 16, 1897 (No. 119).

Pedicularis chamissonis Stev.

Bering Island, July 23, 1895 (No. 25), and Nikolski, Bering Island, July 15, 1897 (No. 118).

Rhinanthus crista-galli L.

Preobrazhenskoye, Copper Island, August 18, 1897 (No. 174).

SELAGINACEÆ.

Lagotis glauca J. Gærtn.

Preobrazhenskoye, Copper Island, August 18, 1897 (No. 180).

PLANTAGINACEÆ.

Plantago major asiatica Decaisne.

Nikolski, Bering Island, July 15, 1897 (No. 114).

COMPOSITÆ.

Solidago virgaurea L.

Nikolski, Bering Island, August 6, 1897 (No. 175), and at Preobrazhenskoye, Copper Island, August 18, 1897 (No. 179).

Anaphalis margaritacea occidentalis Greene.

Glinka, Copper Island, August 20, 1897 (No. 168).

Achillea ptarmica speciosa Herd.

This species has not been reported before from these islands. Preobrazhenskoye, Copper Island, August 18, 1897 (No. 173).

Chrysanthemum arcticum L.

Bering Island, July 23, 1895 (No. 38); Nikolski, Bering Island, July 15, 1897 (No. 93).

Artemisia norvegica pacifica Gray.

Nikolski, Bering Island, August 8, 1897 (No. 148); also by N. Grebnitski in 1891.

Artemisia vulgaris L.

Nikolski, Bering Island, August 6, 1897 (No. 142).

Artemisia richardsoniana Bess.

Glinka, Copper Island, August 7, 1895 (No. 48); South Rookery, Bering Island, July 29, 1897 (No. 111).

Arnica unalaschkensis Less.

Nikolski, Bering Island, July 16, 1897 (No. 123), and South Rookery, Bering Island, July 29, 1897 (No. 135).

Senecio palmatus Ledeb.

Nikolski, Bering Island, August 6, 1897 (No. 141).

Senecio pseudo-arnica Less.

Nikolski, Bering Island, August 1, 1897 (No. 140).

Cacalia auriculata DC.

Nikolski, Bering Island, August 6, 1897 (No. 145).

Carduus kamtschaticus Ledeb.

Nikolski, Bering Island, August 6, 1897 (No. 143).

Saussurea tilesii Ledeb.?

Leaves broader than is shown in Ledebour's figure.

Nikolski, Bering Island, August 6, 1897 (No. 144).

Picris hieracioides L.

Dr. Gray refers the plant collected by Dr. Stejneger in 1885 to the var. *japonica*. The present plant corresponds better to the type form than to the variety.

Nikolski, Bering Island, August 9, 1897 (No. 155).

Hieracium triste Cham.

Nikolski, Bering Island, July 15, 1897 (No. 117).

Taraxacum taraxacum (L.) Karst.

Nikolski, Bering Island, July 9, 1897 (No. 84).

D. LIST OF ILLUSTRATIONS AND MAPS.

[The maps and photographs are by the author unless otherwise stated.]

Plate No.

1.—Robben Island, Okhotsk Sea; barracks and officers' quarters from boat landing. August 31, 1896.
2.—Robben Island, Okhotsk Sea; officers' quarters; Lieutenant Kolubakine, I. R. N., and Lieutenant Garrett, U. S. N.
3.—Robben Island, Okhotsk Sea; south end of rock with the company's buildings, the shanty of the Aleut workmen to the left, the salt house to the right. August 31, 1896.
4.—Robben Island, Okhotsk Sea; top of rock, looking northeast from above Aleut house.
5.—Robben Island, Okhotsk Sea; entire rookery from photographic station No. 2 (see map pl. 93), looking toward the south end of the island. August 31, 1896, 8.10 a. m. The white specks on the beach are a flock of kittiwake gulls (*Rissa pollicaris*).
6.—Robben Island, Okhotsk Sea; entire rookery from photographic station No. 3, looking northeast. August 31, 1896, 8.20 a. m.
7.—Robben Island, Okhotsk Sea; rookery from photographic station No. 4, northern third. August 31, 1896, 11.30 a. m.
8.—Robben Island, Okhotsk Sea; rookery from photographic station No. 4, middle third. August 31, 1896, 11.30 a. m.
9.—Robben Island, Okhotsk Sea; rookery from photographic station No. 4, southern third. August 31, 1896, 11.30 a. m.
10.—South rookery, Bering Island, from the west (photograhic station No. 3, see map pl. 98) toward the waterfall. August 1, 1896, 4.30 p. m. (Compare with pl. 28.)
11.—South rookery, Bering Island, looking west from photographic station No. 1. August 1, 1896, 3 p. m. (Compare with pl. 29.)
12.—Gavarushakaya, or Vodopad, Glinka rookery, Copper Island, looking toward Babinskaya Pad and southeast Cape. August 6, 1896, 11 a. m.
13.—Driveway from Zapadni rookery, Glinka, Copper Island, looking up the gully from the beach. August 21, 1897. (Compare with plate 58*a*.)
14.—Zapalata rookery, Glinka, Copper Island, looking toward Stolbi, from nearly same standpoint as pl. 55. August 6, 1896, 10.30 a. m.
15*a*.—*Heracleum lanatum*, north rookery, Bering Island, August 23, to show the luxuriant growth of vegetation.
15*b*.—Yurt or sod hut, Nikolski, Bering Island. August 20, 1895.
16*a*.—Wooden frame of yurt, North Rookery village, Bering Island, 1895.
16*b*.—Kamchatkan cattle, Nikolski, Bering Island, 1895.
17*a*.—Nikolski village, Bering Island, from bluff back of schoolhouse. July 11, 1895. In the background to the left the three Saranna Lotka Mountains.
17*b*.—New schoolhouse (left) and governor's office (right), Nikolski village, Bering Island.
18*a*.—Company's house, Nikolski, Bering Island. Mr. Grebnitski, inside of fence; Mr. Kluge, outside.
18*b*.—Company's store, Nikolski, Bering Island, 1895. Beyond, the residence of the Russian administrator.
19*a*.—Reef and Sivutchi Kamen, north rookery, Bering Island, from sledge road. Killing grounds with barrels for salted seal meat in middle foreground. July 15, 1895.
19*b*.—Reef and Sivutchi Kamen, north rookery, Bering Island, from driveway at lower end of killing grounds. July 9, 1895, 6.30 p. m.
20.—Reef and Sivutchi Kamen, north rookery, Bering Island. Pencil sketch by the author, July 30, 1882, to show distribution of seals.
21*a*.—Reef and Sivutchi Kamen, west half, north rookery, Bering Island, July 15, 1895, 5 p. m., to show distribution of seals as compared with pl. 20.
21*b*.—The same, east half.
22*a*.—Reef, north rookery, Bering Island, from driveway, July 15, 1895, 5.30 p. m., showing plenty of seals in the water; west half.
22*b*.—The same, east half.
23.—Kishotchnaya, north rookery, Bering Island. July 16, 1895, 9.45 a. m., low water.
24.—Salt house with skin chute, north rookery, Bering Island. Natives making ready to carry the bundled seal skins to the boats for shipping. August 13, 1895.
25*a*.—Beach at north rookery, Bering Island. Group of natives with seal skins at the landing place waiting for the boats from the steamer. Salt house in the background to the left.
25*b*.—Village at north rookery, Bering Island. To the left the company's house; in the center the kossak's house; in the background the yurts, or sod huts, of the natives (the new village). From salt house, August 13, 1895.
26*a*.—Reef, north rookery, Bering Island. July 4, 1895, about 2 p. m. Reduced copy of photographs by by C. H. Townsend. Breeding seals in three disconnected patches to the left of picture.

26*b*.—Same. July 9, 1895, about 5 p. m. Photograph by N. Grebnitski, showing the breeding seals occupying a continuous area; also the "band" across the "sands."

27*a*.—Reef and Sivutchi Kamen, north rookery, Bering Island. Photograph by Colonel Voloshinof, 1885. From nearly same point as pl. 22, with which it should be compared for distribution of seals on breeding ground.

27*b*.—Steller's Arch, near south rookery, Bering Island. August 17, 1895.

28.—South rookery, Bering Island, from the west (photogaphic station No. 3, see map, pl. 10) toward the waterfall. August 17, 1895, 2 p. m.

29.—South rookery, Bering Island, looking west from photographic station No. 1. August 17, 1895, noon.

30.—South rookery, Bering Island. Females and pups. From photographic station No. 2. August 17, 1895, noon.

31*a*.—South rookery, Bering Island. Copy of photograph by Colonel Voloshinof to show distribution of seals in 1885. Western half.

31*b*.—Same. Eastern half. Both from nearly same standpoint as my pl. 29, and same as pl. 67.

32*a*.—Salt house, south rookery, Bering Island. Nikanor Grigorief, the native overseer. September 9, 1895.

32*b*.—Waterfall at south rookery, Bering Island.

33.—Preobrazhenskoye village, Copper Island, looking west. In the background, Pestshani Mys, the tops being hidden in the fog, and the company's steamer, *Kotik*, at anchor. The nearest light-painted house is the schoolhouse; the one farther back is the dwelling and office of the assistant administrator; the dark houses to the right of it are the company's store, magazines, and dwelling house. July 28, 1895.

34*a*.—Karabelni village, Copper Island, from the beach at mouth of river. August 12, 1895.

34*b*.—Glinka village, Copper Island, from the hill behind it. August 7, 1895.

35.—Glinka village, Copper Island, from the beach. In the middle ground the salt houses to the left; the Government house to the right. August 11, 1895.

36*a*.—Interior of salt house, Glinka, Copper Island. Seal skins in salt.

36*b*.—Same. Seal skins bundled, ready for shipment.

37.—Beach at Glinka village, Copper Island. Natives getting ready to leave for the main village after having finished the sealing.

38*a*.—Karabelni Stolp, Copper Island, from photographic station No. 4 (see map, pl. 12). August 1, 1895, noon.

38*b*.—Karabelni Stolp, Karabelnoye rookery, Copper Island. From bluff, photographic station No. 1. August 2, 1895, 9.15 a. m.

39.—Karabelnoye rookery, Copper Island, looking west toward Karabelni Stolp, from photographic station No. 3. August 1, 1895, 11 a. m.

40.—Karabelnoye rookery, Copper Island, looking east toward Vodopadski Mys, from photographic station, No. 2. August 1, 1895, 10 a. m.

41.—Karabelni Stolp, Copper Island. Pencil sketch by the author, July 3, 1883, from photographic station No. 1, to show distribution of seals as compared with my photograph of 1895, from same standpoint, pl. 38*b*.

42.—Karabelnoye rookery, Copper Island, looking west. Pencil sketch by the author, July 3, 1883, from photographic station No. 3, to show distribution of breeding seals as compared with my photograph of 1895, from same standpoint, pl. 39.

43.—Karabelnoye rookery, Copper Island, looking east. Pencil sketch by the author, July 3, 1883, from photographic station No. 2, to show distribution of breeding seals as compared with my photograph of 1895, from same standpoint, pl. 40.

44*a*.—Bolshaya Bukhta, Karabelnoye rookery, Copper Island. From reef at extreme end of Karabelni Stolp. The snow patch at the beach is the same as the one seen near the lower left-hand corner in pl. 40. From a photograph by Mr. Grebnitski, August 1, 1895, 9.45 a. m.

44*b*.—Drive steps, Stolbovaya Bukhta, Karabelnoye rookery, Copper Island, August 1, 1895. From photographic station No. 5.

45.—Drive steps and waterfall, Vodopad, Karabelnoye rookery, Copper Island. August 2, 1895.

46.—Palata, Copper Island, seen from Zapadni, to show character of beach. Photograph by Mr. Grebnitski, August 7, 1895.

47.—Palata beach, Glinka, Copper Island, showing the character of the reef. Photograph by Mr. N. B. Miller of the U. S. Fish Commission steamer *Albatross*, June 4, 1892.

48.—Palata rookery, Copper Island, from a rock off the rookery. Looking up the gully to the right; mountains in the background hidden in the fog. August 2, 1895, 2.30 p. m.

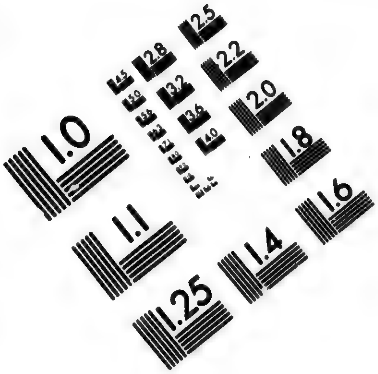
49.—Palata rookery, Copper Island, from the same point as pl. 48, looking toward Sabatcha Dira. Top of mountains hidden in the fog. August 2, 1895, 2.30 p. m.

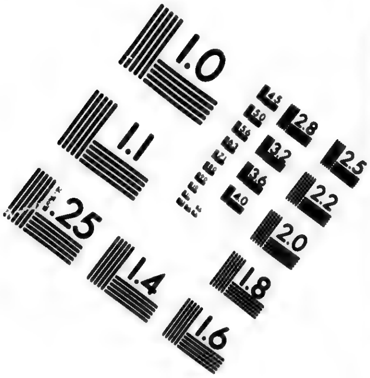
50.—Palata rookery, Copper Island, from nearly the same point as pl. 55, looking down the gully toward Karabelni. In lower left-hand corner, slope of Palata; in upper right-hand corner, Zapadni and Pestshani Mys. August 7, 1895, 12.30 p. m.

51.—Palata rookery, Glinka, Copper Island, August 7, 1895, 9.40 a. m. From hill north of Palata, on map (pl. 14) marked 806 feet.

52.—Palata rookery, Glinka, Copper Island. Pencil sketch by the author, July 16, 1883. Standpoint same as my photograph of 1895 (pl. 51), to show distribution of seals.

53*a*.—Palata rookery, Glinka, Copper Island. Photograph by Colonel Voloshinof, 1885. Standpoint a little farther to the right and lower down than my sketch of 1883 (pl. 52) and my photograph of 1895 (pl. 51), but identical with that of plate 72.





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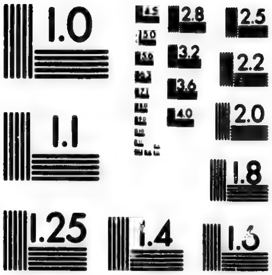

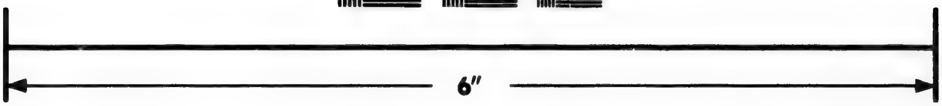

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53*b*.—Zapadni rookery, Glinka, Copper Island. Photograph by Colonel Voloshinof, 1885. For comparison with pl. 54*a* as regards distribution of breeding seals, and with plate 73 from same standpoint.

54*a*.—Zapadni rookery, Glinka, Copper Island. From same point as pl. 51 (hill on map 14 marked 806 feet) looking west. The extreme promontory in the background to the left is Vodopadski Mys, then follow Lebiazhi Mys and Pestshani Mys. August 7, 1895.

54*b*.—Urili Kamen rookery, Glinka, Copper Island. Looking from Peresheyek toward Pestshani Mys, which is hidden in the fog. Breeding seals among the stones in the foreground. August 3, 1895, 10 a. m.

55.—Zapalata rookery, Glinka, Copper Island. From base of crest of Palata (just beyond watchhouse), looking toward Stolbi. August 7, 1895, noon.

56.—Zapalata rookery, Glinka, Copper Island. From base of crest of Palata (same standpoint as pl. 55), looking toward the extreme end of Palata. August 7, 1895, noon.

57*a*.—Zapalata rookery, Glinka, Copper Island. From a photograph by Colonel Voloshinof, 1885. Standpoint exactly the same as my photograph of 1895 (pl. 56), with which it should be compared for distribution of the seals.

57*b*.—Sikatchinskaya Bukhta, Glinka, Copper Island, seen from the rocks off the rookery. Photograph by Mr. Grebnitski, August 2, 1895.

58*a*.—Driveway from Zapadni rookery, Glinka, Copper Island. Rainy morning. August 8, 1895, 7.30 a. m. Looking down the gully. Compare with pl. 13.

58*b*.—Driveway up from Pestshani hauling grounds, Glinka, Copper Island. August 2, 1895.

58*c*.—Pestshani salt house, near Glinka village, Copper Island. August 4, 1895.

59*a*.—Hutchinson, Kohl, Philippeus & Co.'s steamer *Aleksander II*. From a photograph by H. W. Domes, Oakland, Cal.

59*b*.—Schooner *Bobrik*, Capt. D. Grœnberg, in the harbor of Petropaulski. The guard ship of Robben Island, belonging to the Russian Seal Skin Company. August 27, 1895.

59*c*.—Reduced copy of Choris's picture of fur seals on the rookery at St. Paul, Pribilof Islands. Voy. Pitt. aut. Monde, pl. xv.

60.—Salmon weir, "Zaporr," across the river at Saranna, Bering Island. July 20, 1895. The weir is full of silver salmon.

61*a*.—Saranna village, west half, Bering Island. The salmon weir in the foreground. July 20, 1895.

61*b*.—Saranna village, east half, Bering Island. In foreground scaffolding with a salmon hung up to dry. July 20, 1895.

62*a*.—Native dragging along a seal which is too tired to move. Drive from Zapadni, Glinka, Copper Island. August 8, 1895, 8.45 a. m. Drizzling rain.

62*b*.—Baby skin-carrier. Same drive.

63*a*.—Salt house at Popofski, near Karabelni village, Copper Island. August 12, 1895.

63*b*.—Seals sliding down the last embankment, Glinka village, Copper Island. Drive, August 8, 1895.

64.—Dead seal pups in wind rows, Reef, north rookery, Bering Island. September 16, 1895, 8.15 a. m.

65*a*.—Petropaulski Harbor, Kamchatka, from hill behind the town. In the background, on the south side of Avatcha Bay, the volcano Velutchinskaya Sopka. The men-of-war, the British cruiser *Porpoise* (white) and the Russian transport *Yakut* (black), off the Russian Seal Skin Company's wharf. August 26, 1895.

65*b*.—Petropaulski, Kamchatka, from the Russian Seal Skin Company's wharf. In the background the volcano Koriatskaya Sopka. The vessel anchored in the stream is the Russian transport *Yakut*. September 2, 1895.

66*a*.—The Russian Seal Skin Company's wharf, magazines, and steamer *Kotik*, Capt. C. E. Lindquist, at Petropaulski, Kamchatka. September 4, 1895.

66*b*.—Former headquarters of Hutchinson, Kohl, Philippeus & Co., Petropaulski, Kamchatka. September 2, 1895.

67.—South rookery, Bering Island. From same standpoint as Colonel Voloshinof's photographs, 1885 (pl. 31). July 24, 1897, 2.15 p. m.

68.—South rookery, Bering Island. Low water; to show character of beach and conditions at the time of the census of 1897. From station 5. July 28, 1897, 10.20 a. m.

69.—South rookery, Bering Island. High water; to show conditions at the time of the census of 1897. From station 5. July 25, 1897.

70.—Palata rookery, Glinka, Copper Island. From nearly the same standpoint as pl. 51. August 6, 1896, 9.50 a. m.

71.—Zapadni rookery, Glinka, Copper Island. From nearly the same standpoint as pl. 54*a*. August 6, 1896, 9.30 a. m.

72.—Palata rookery, Glinka, Copper Island. From Colonel Voloshinof's station of 1885 (pl. 53*a*). August 21, 1897.

73.—Zapadni rookery, Glinka, Copper Island. From Colonel Voloshinof's station of 1885 (pl. 53*b*). August 21, 1897.

74.—Zapalata rookery, Glinka, Copper Island. Looking toward Stolbi, from nearly same standpoint as pl. 55. August 21, 1897.

75.—Sikatchinskaya Bukhta, Glinka, Copper Island. Looking toward Stolbi, from same standpoint as pl. 12. August 6, 1896, 11 a. m.

76.—Gavarushkaya Bukhta, Glinka, Copper Island. From top of the waterfall (vodopad). August 21, 1897, 1 p. m.

77.—Drive at Glinka village, Copper Island, showing the division of the herd into a number of separate detachments. Photograph by N. N. Lukin-Feodotitch, 1895.

78.—Killing seals in front of Glinka village, Copper Island. Photograph by N. N. Lukin-Feodotitch, 1895.
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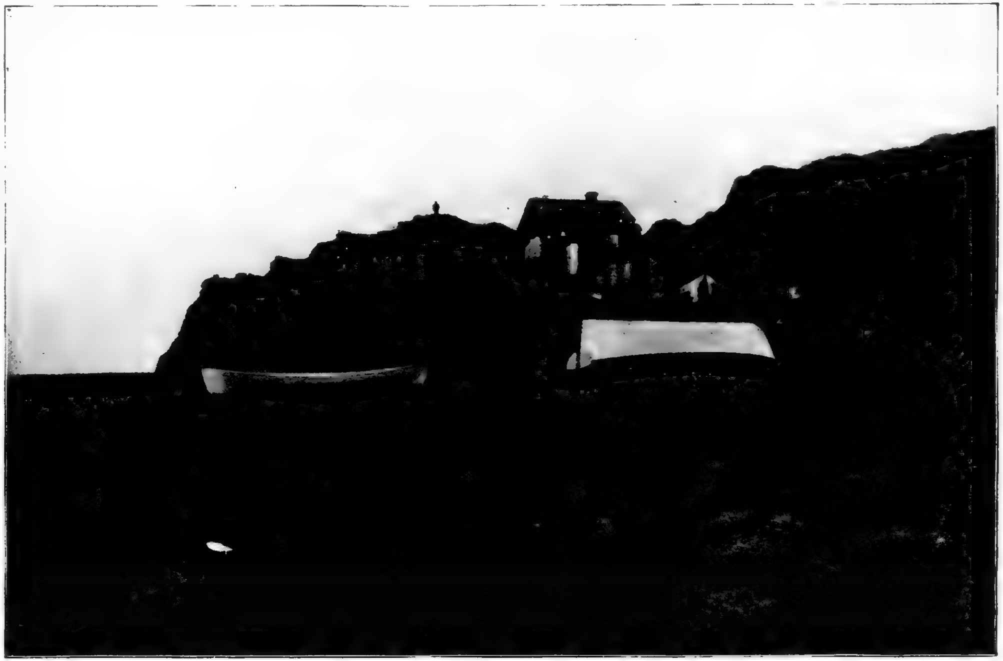
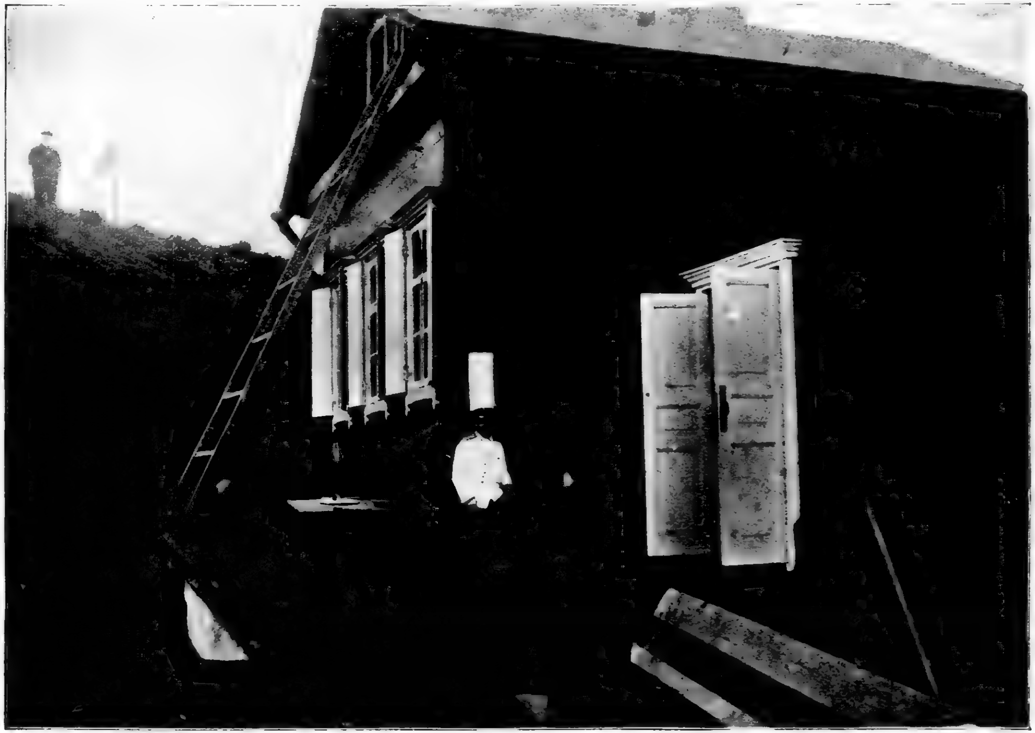
PLATE 1.



ROBBEN ISLAND, OKHOTSK SEA; BARRACKS AND OFFICERS' QUARTERS FROM BOAT LANDING. AUGUST 31, 1896.

PLATE 2.



ROBBEN ISLAND, OKHOTSK SEA; OFFICERS' QUARTERS; LIEUTENANT KOLUBAKINE, I. R. N., AND LIEUTENANT GARRET, U. S. N.

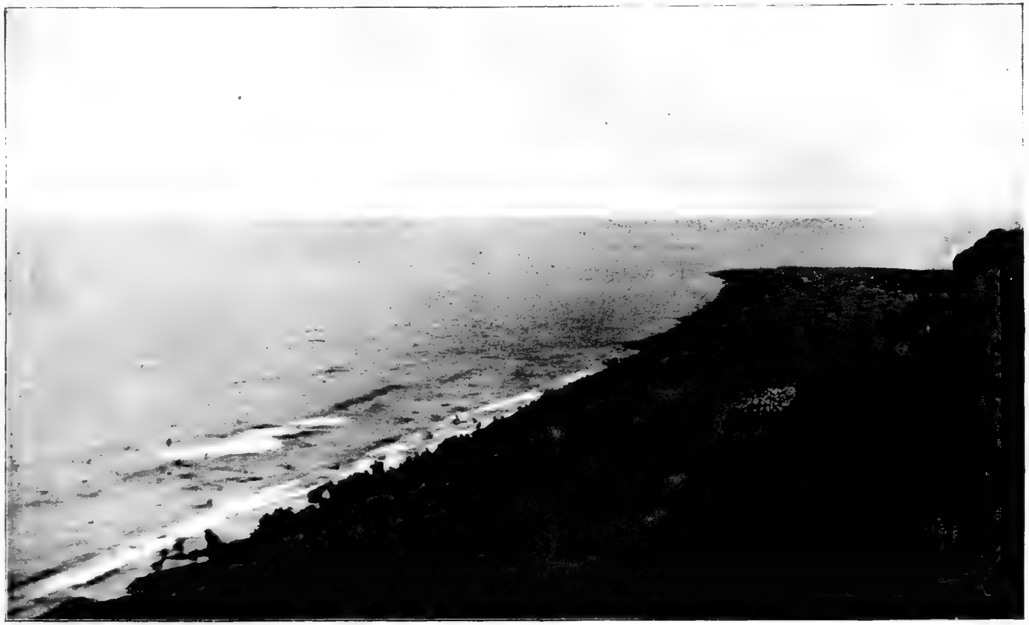
PLATE 3.

ROBBEN ISLAND, SOUTH END OF ROCK WITH COMPANY'S BUILDINGS.

PLATE 4.

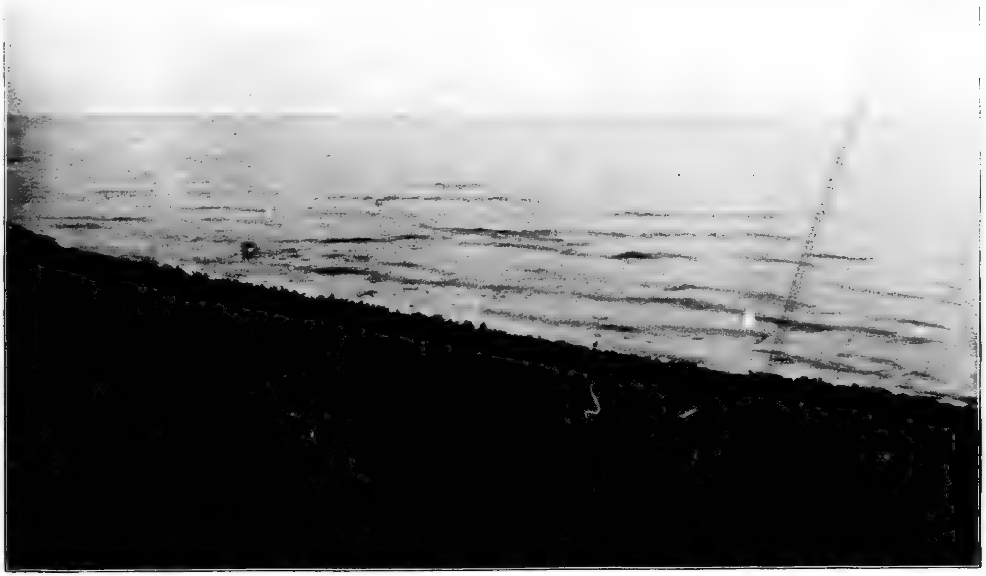
ROBBEN ISLAND; TOP OF ROCK LOOKING NORTHEAST FROM ABOVE ALEUT HOUSE.

PLATE 5.



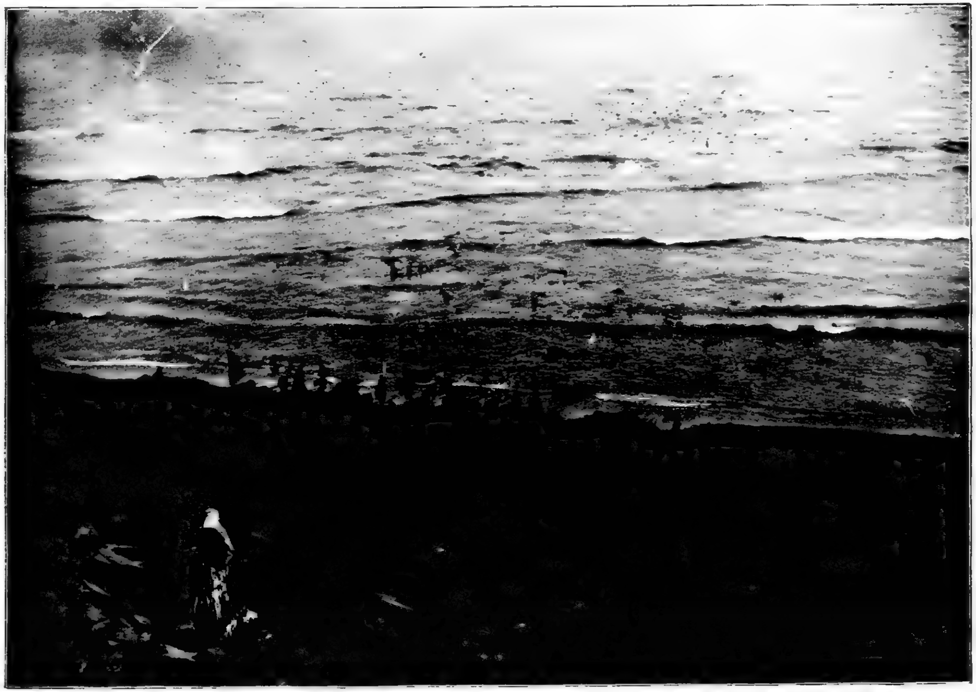
ROBBEN ISLAND; ENTIRE ROOKERY FROM PHOTOGRAPHIC STATION No. 2 (SEE MAP, PLATE 93), LOOKING SOUTH. AUGUST 31, 1896, 8.10 A. M.

PLATE 6.



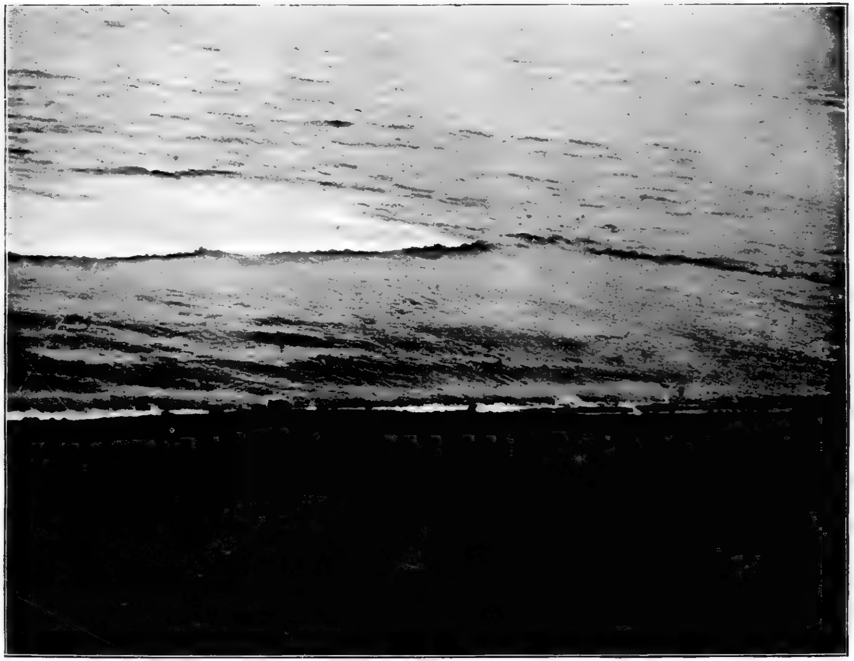
ROBBEN ISLAND; ENTIRE ROOKERY FROM PHOTOGRAPHIC STATION No. 3, LOOKING NORTHEAST. AUGUST 31, 1896, 8.20 A. M.

PLATE 7.



ROBBEN ISLAND; ROOKERY FROM PHOTOGRAPHIC STATION No. 4, NORTHERN THIRD. AUGUST 31, 1896, 11.30 A. M.

PLATE 8.



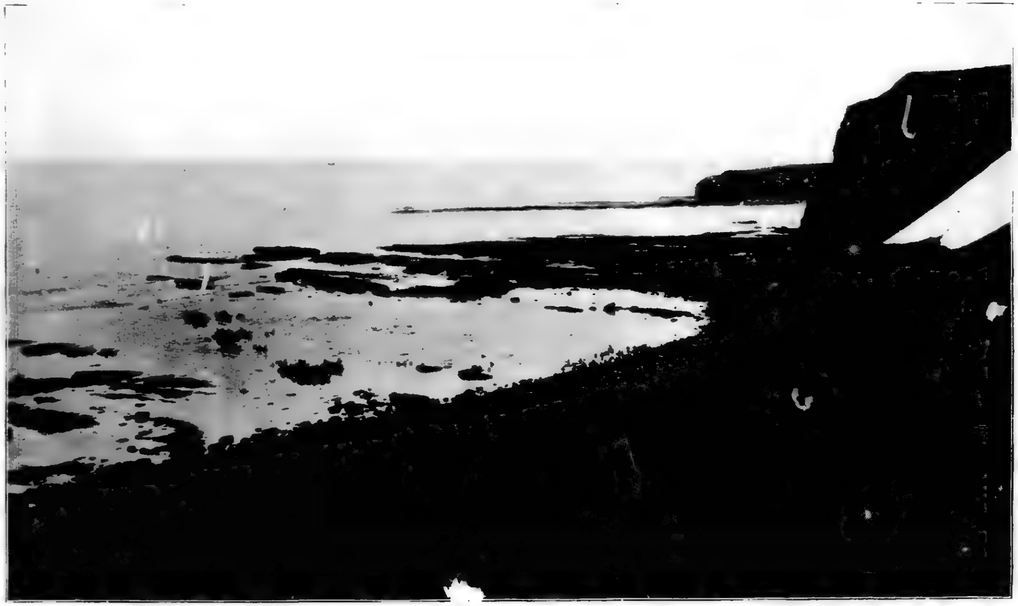
ROBBEN ISLAND; ROOKERY FROM PHOTOGRAPHIC STATION No. 4, MIDDLE THIRD. AUGUST 31, 1896, 11.30 A. M.

ROBBEN ISLAND; ROOKERY FROM PHOTOGRAPHIC STATION No. 4, SOUTHERN THIRD. AUGUST 31, 1896, 11.30 A. M.

PLATE 10.

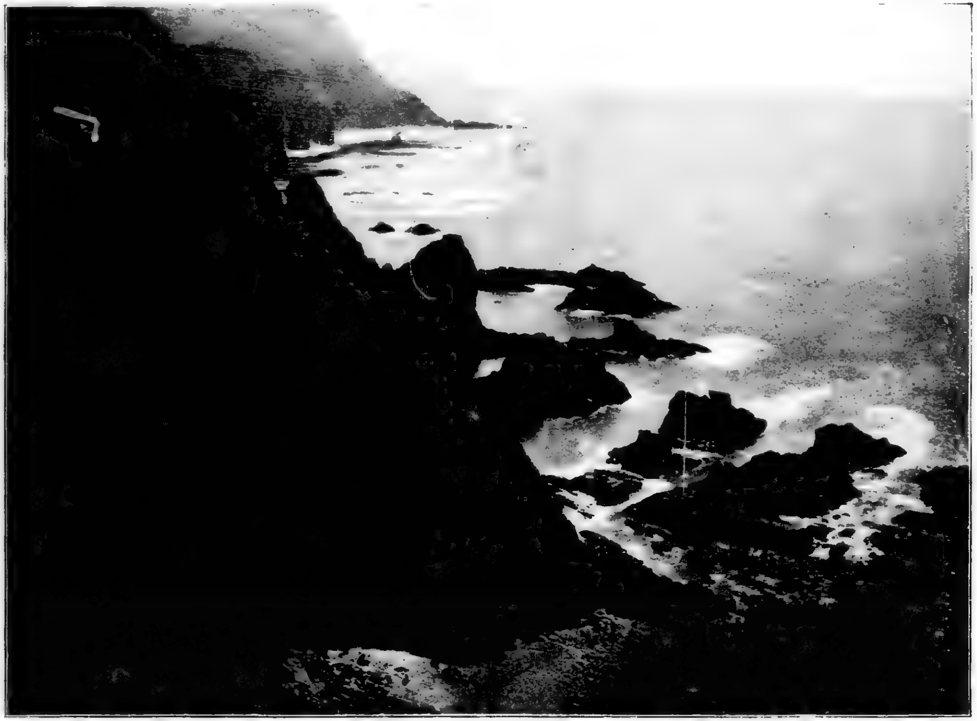
SOUTH ROOKERY, BERING ISLAND, FROM THE WEST. (PHOTO STATION No. 3, SEE MAP PLATE 98) AUGUST 1, 1896, 4.30 P. M.
(Compare with pl. 28).

PLATE 11.

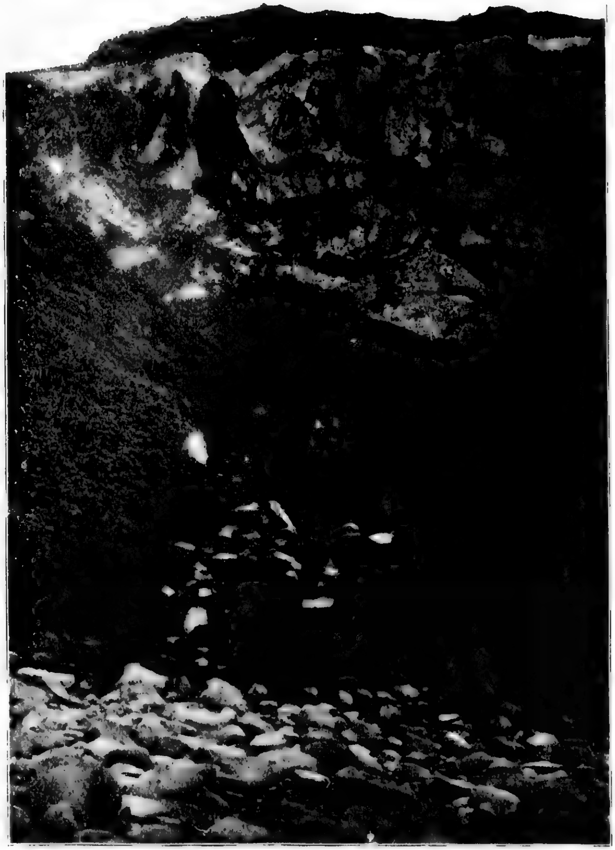


SOUTH ROOKERY, BERING ISLAND, LOOKING WEST FROM PHOTO STATION No. 1. AUGUST 1, 1896, 3 P. M.
(Compare with pl. 29.)

PLATE 12.



GAVARUSHAKAYA, OR VODOPAD, GLINKA ROOKERY, COPPER ISLAND, LOOKING TOWARD BABINSKAYA PAD AND SOUTHEAST CAPE
AUGUST 6, 1896, 11 A. M.



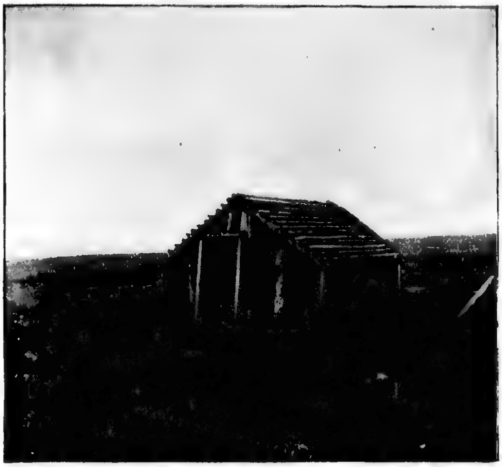
DRIVEWAY FROM ZAPADNI ROOKERY, GLINKA, COPPER ISLAND, LOOKING UP THE GULLY.

PLATE 14.

ZAPALATA ROOKERY, GLINKA, COPPER ISLAND, LOOKING TOWARD STOLBI. AUGUST 6, 1896, 10.30 A. M.

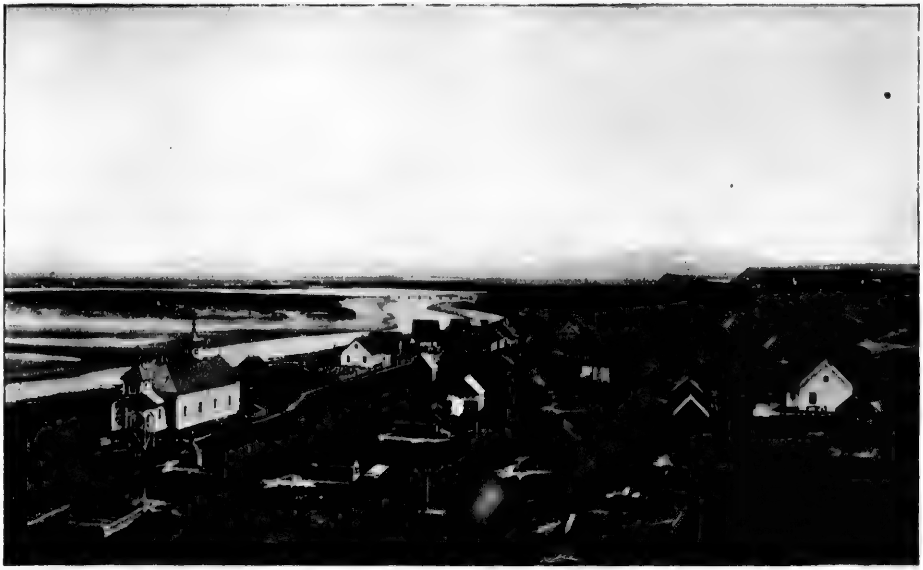
a. Heracleum lanatum. NORTH ROOKERY, BERING ISLAND

b.—YURT, OR SOD HUT, NIKOLSKI, BERING ISLAND.

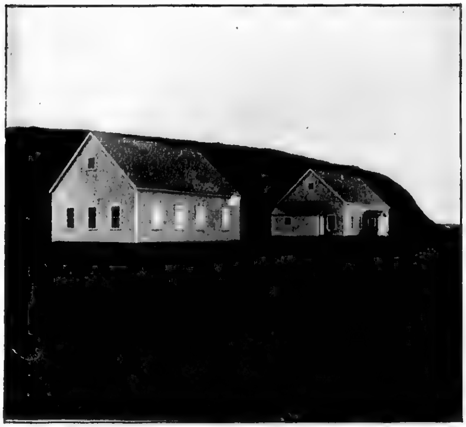


a.—WOODEN FRAME OF YURT, NORTH ROOKERY VILLAGE, BERING ISLAND.

b.—KAMCHATKAN CATTLE, BERING ISLAND.



a.—NIKOLSKI VILLAGE BERING ISLAND.



b.—NEW SCHOOLHOUSE AND GOVERNOR'S OFFICE, NIKOLSKI, BERING ISLAND.

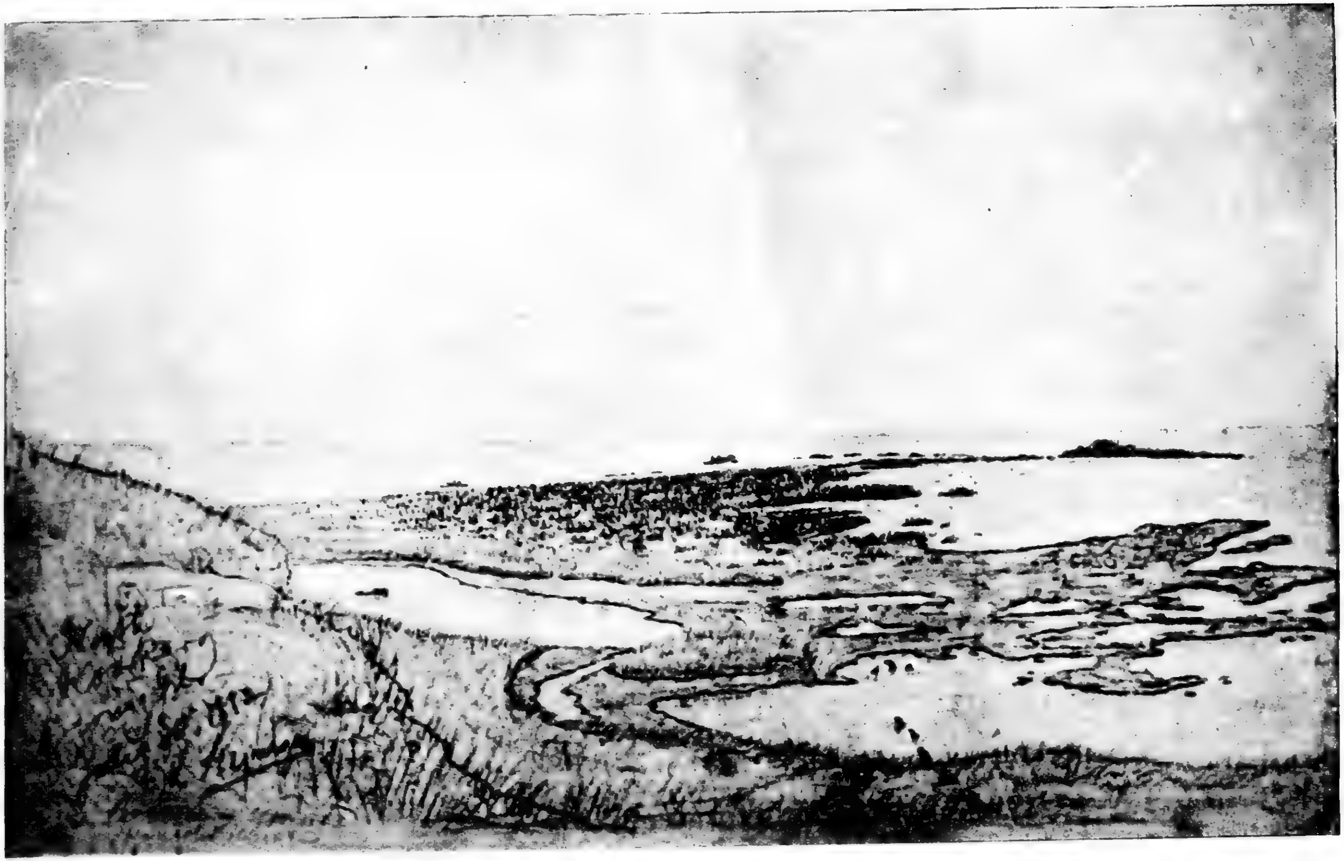
a.—COMPANY'S HOUSE, NIKOLSKI, BERING ISLAND.

b.—COMPANY'S STORE, NIKOLSKI, BERING ISLAND.

a.—REEF AND SIVUTCHI KAMEN, NORTH ROOKERY, BERING ISLAND. FROM SLEDGE ROAD.

b.—SAME FROM DRIVEWAY AT LOWER END OF KILLING-GROUNDS.

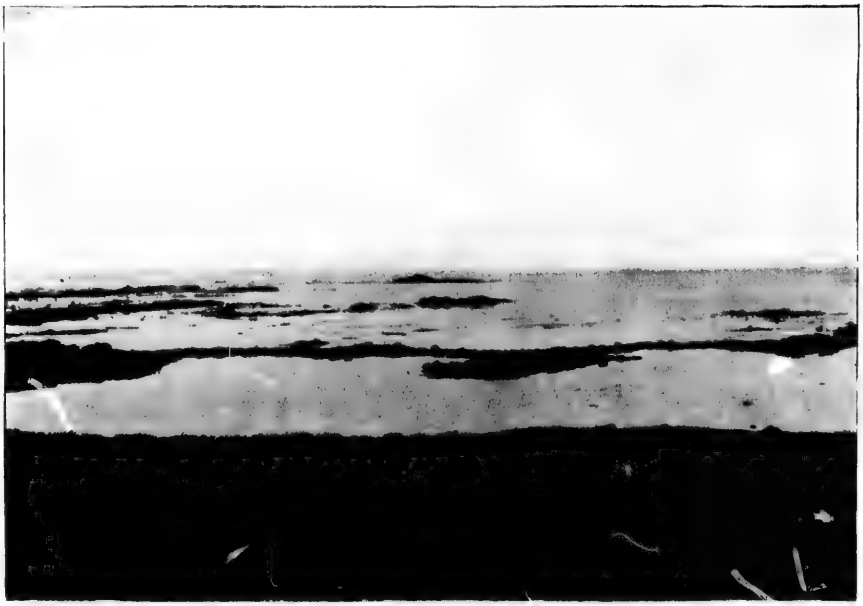
PLATE 20.



REEF AND SIVUTCHI KAMEN, NORTH ROOKERY, BERING ISLAND.

Pencil sketch by the author, July 30, 1882, to show distribution of seals.

a.—Western half.



b.—Eastern half.

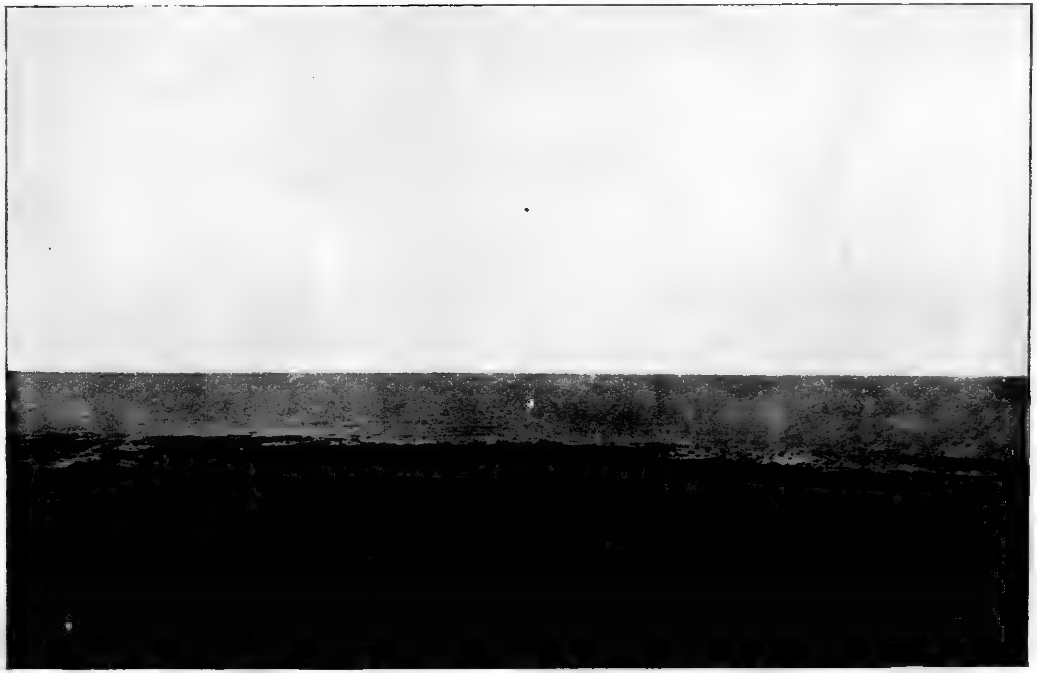
REEF AND SIVUTCHI KAMEN, NORTH ROOKERY, BERING ISLAND, JULY 15, 1895, TO SHOW DISTRIBUTION OF SEALS.

a.—Western half.

b.—Eastern half.

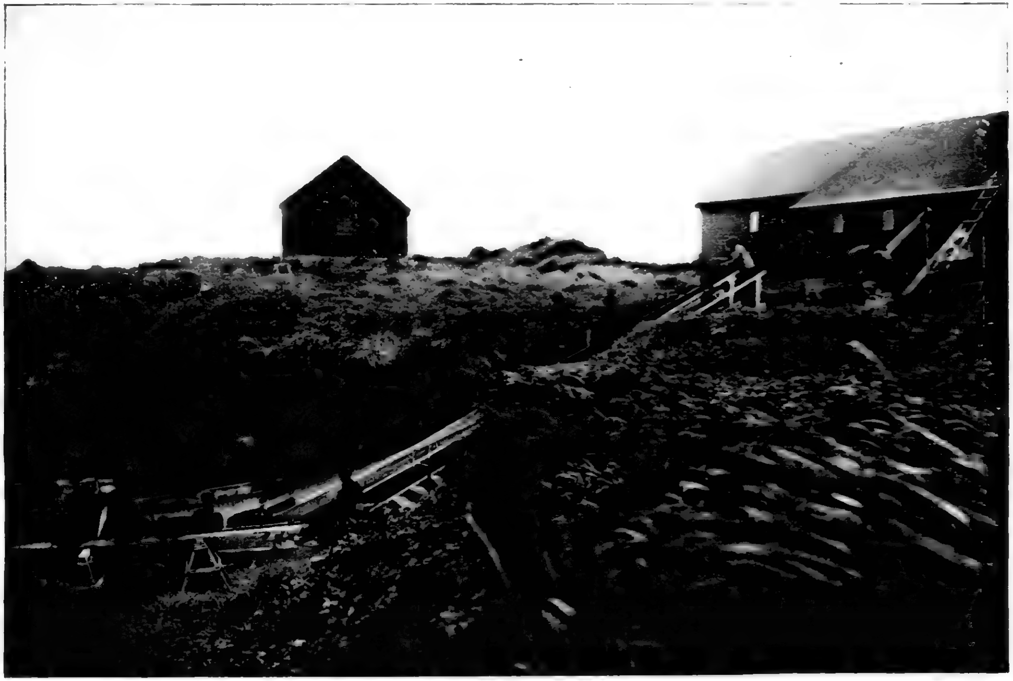
REEF AND SIVUTCHI KAMEN. NORTH ROOKERY, BERING ISLAND, JULY 15, 1895, FROM DRIVEWAY.

PLATE 23.



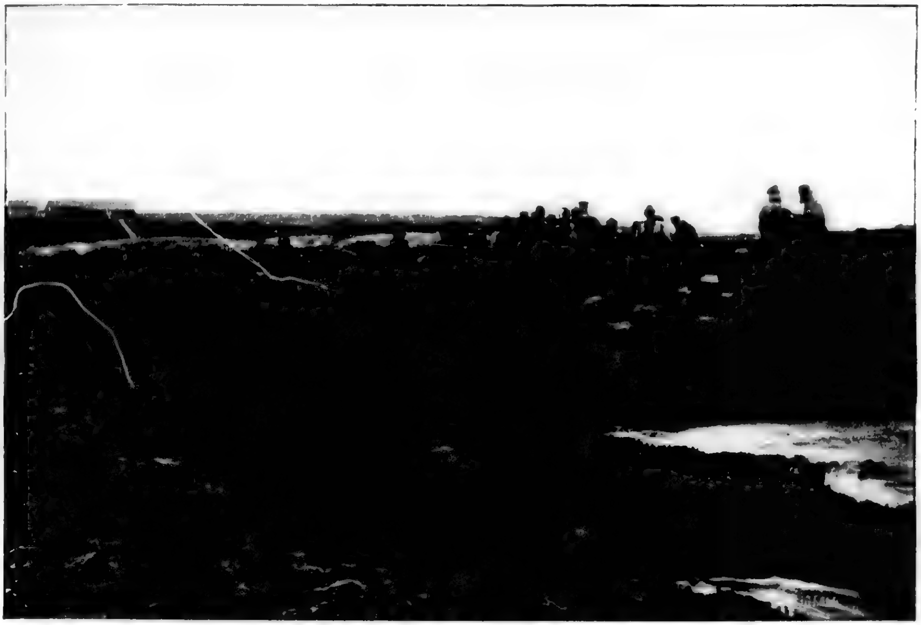
KISHOTCHNAYA, NORTH ROOKERY, BERING ISLAND, JULY 16 1895

PLATE 24.

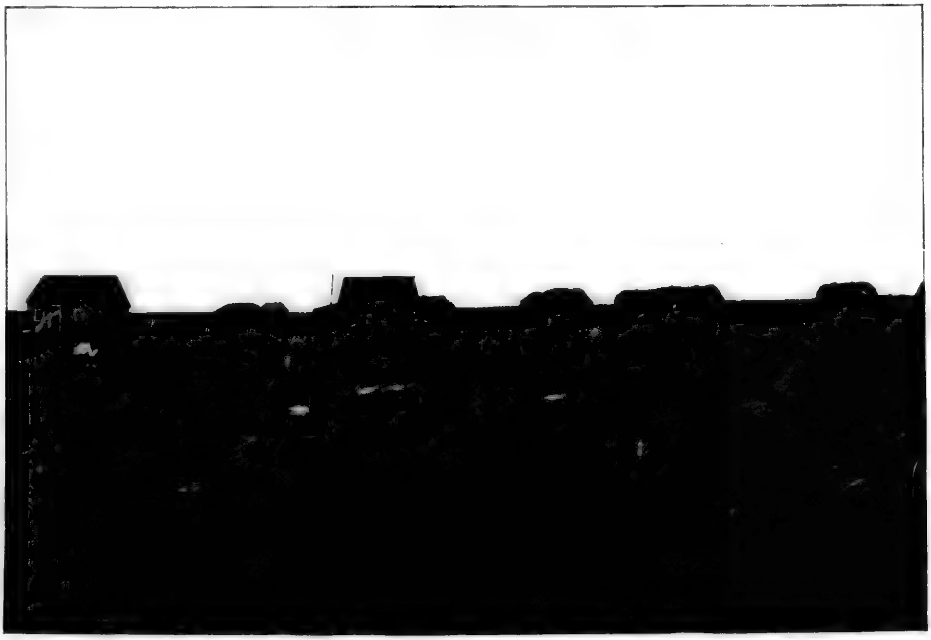


SALT-HOUSE, WITH SKIN CHUTE, NORTH ROOKERY, BERING ISLAND

PLATE 25.

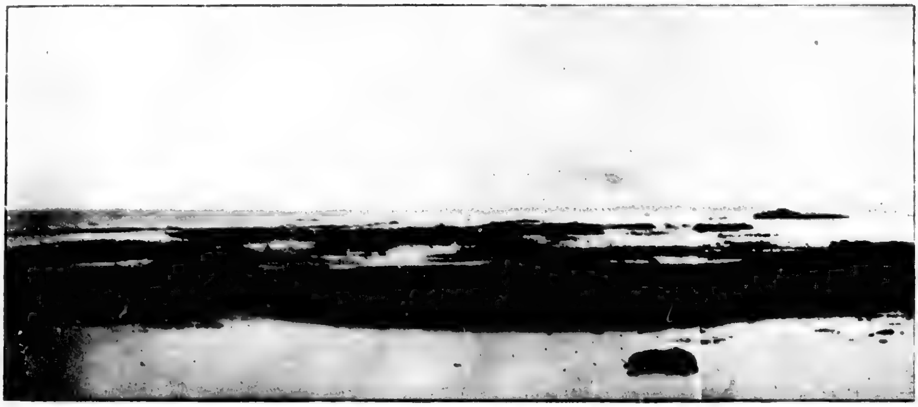


a.—BEACH, NORTH ROOKERY, BERING ISLAND. NATIVES READY TO LOAD SKINS INTO THE BOATS.



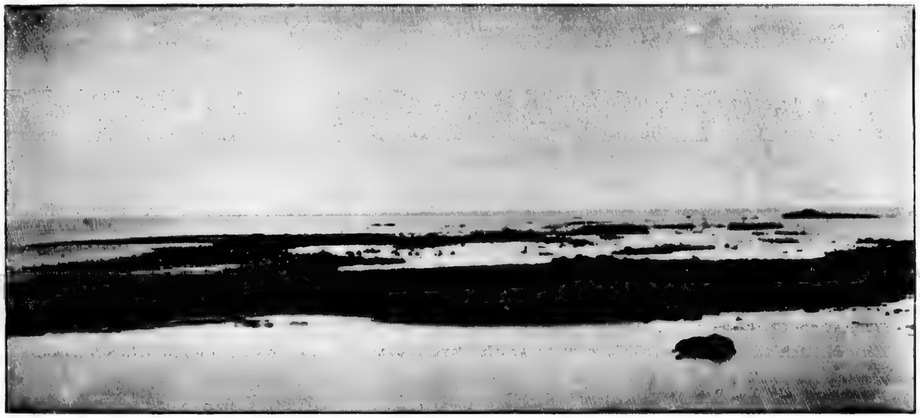
b.—VILLAGE AT NORTH ROOKERY, BERING ISLAND. FROM SALT-HOUSE.

PLATE 26.



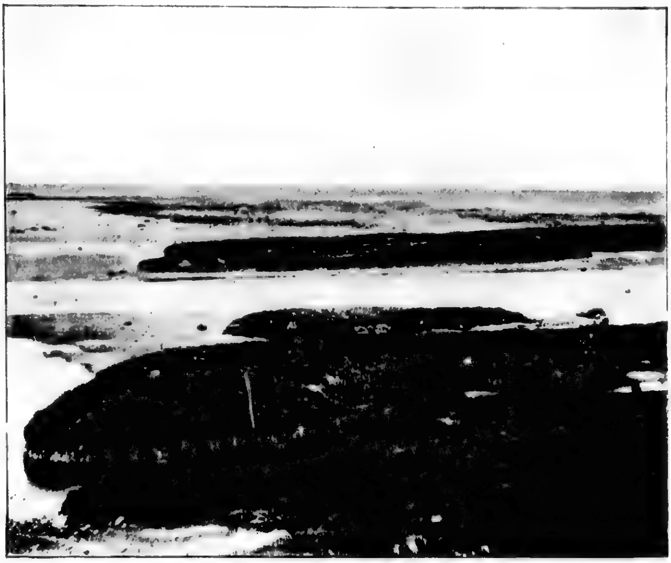
a. REEF, NORTH ROOKERY, BERING ISLAND, JULY 4, 1895. BREEDING SEALS IN THREE DISCONNECTED PATCHES TO THE LEFT.

Reduced from photographs by C. H. Townsend.



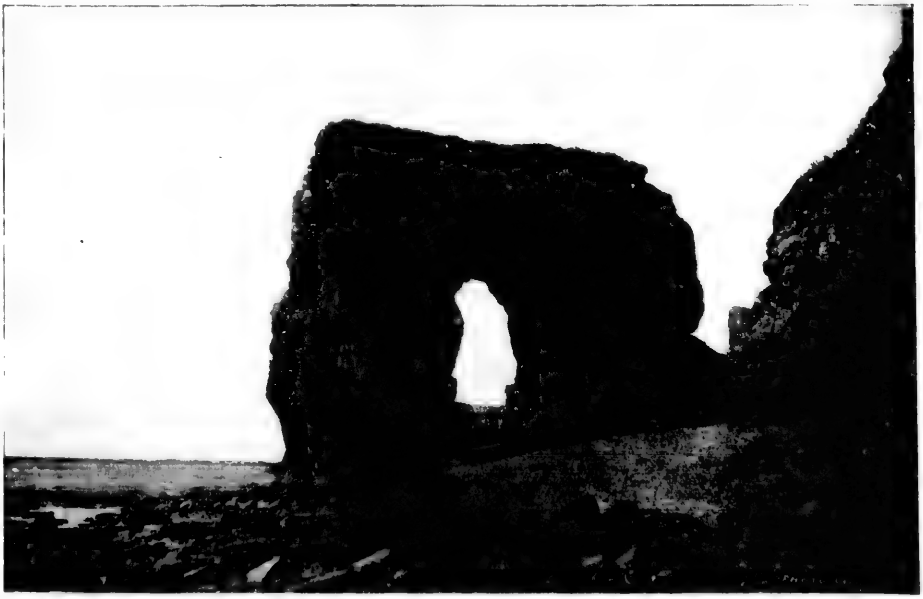
b.—SAME, JULY 9, 1895, SHOWING THE BREEDING SEALS OCCUPYING A CONTINUOUS AREA; ALSO THE "BAND" ACROSS THE "SANDS."

Photograph by N. Grebnitski.



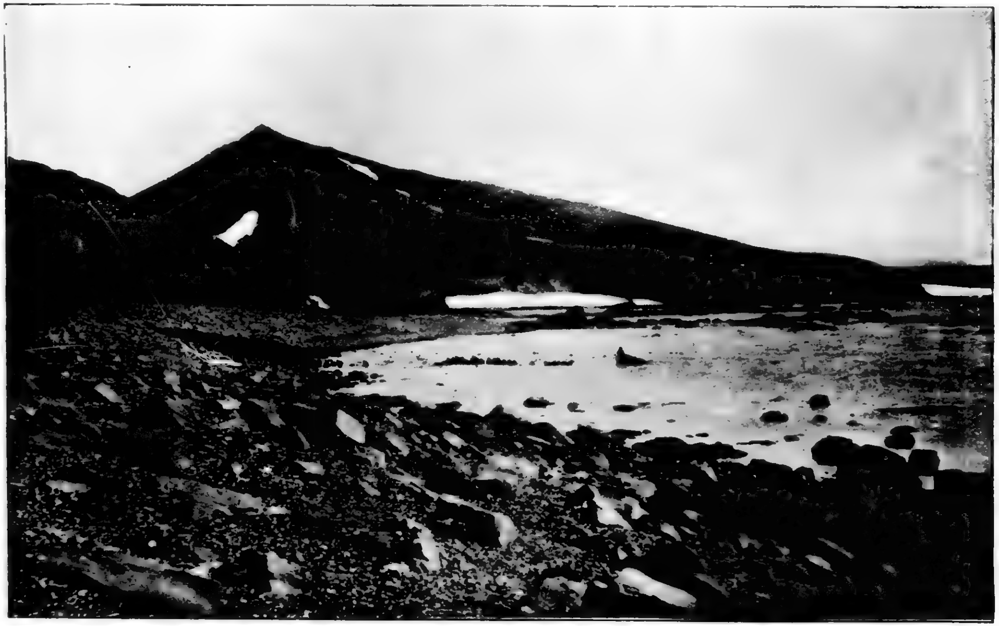
a. REEF AND SIVUTCHI KAMEN, NORTH ROOKERY, BERING ISLAND.

Photograph by Colonel Voloshinof, 1885. From nearly same standpoint as plate 22*b*.



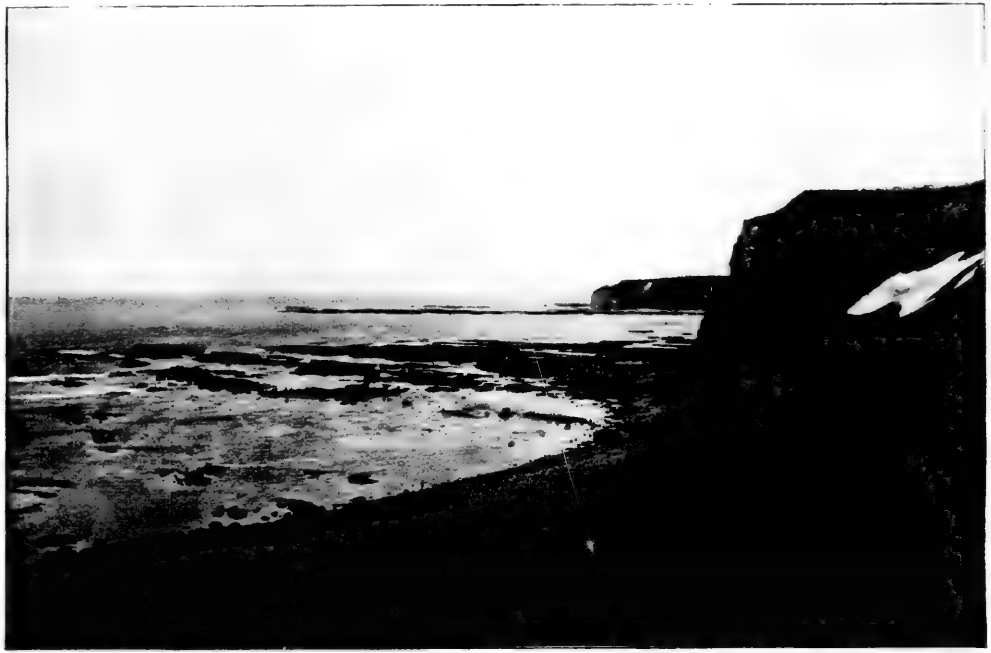
b. STELLER'S ARCH, NEAR SOUTH ROOKERY, BERING ISLAND.

Plate 28.



SOUTH ROOKERY, BERING ISLAND, FROM PHOTOGRAPHIC STATION No. 3 (MAP, PLATE 97). AUGUST 17 1895.

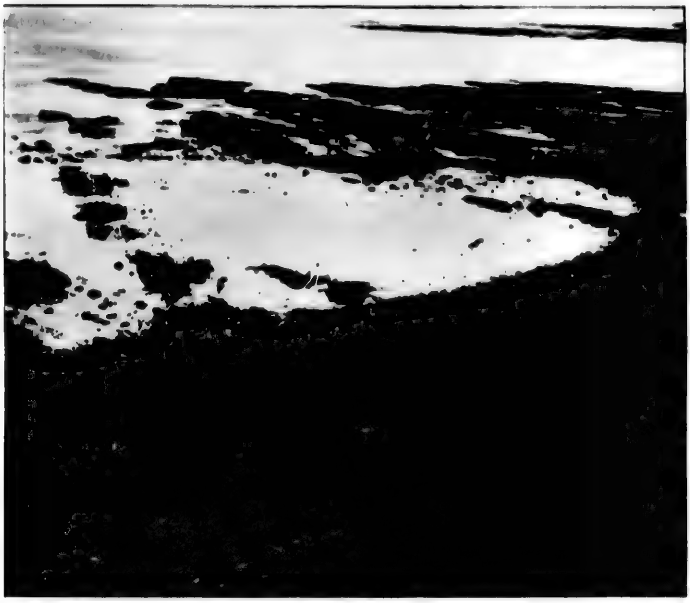
PLATE 29.



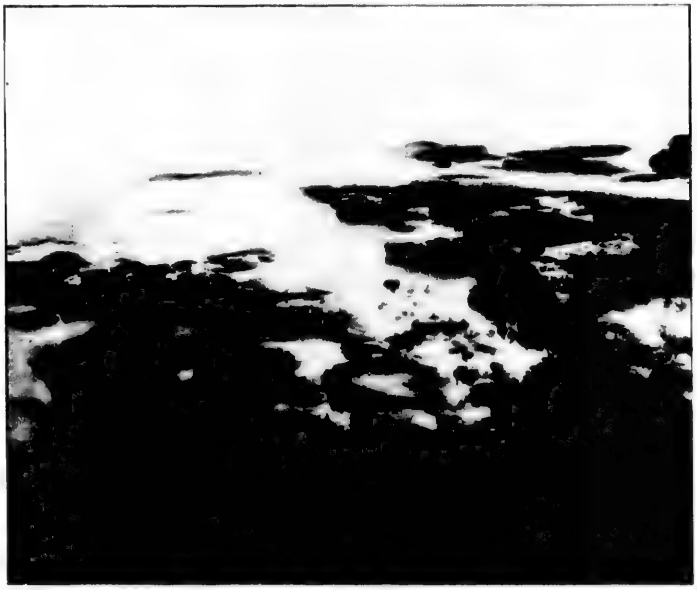
SOUTH ROOKERY, BERING ISLAND, LOOKING WEST FROM PHOTOGRAPHIC STATION No. 1 (MAP, PLATE 97). AUGUST 17, 1895.

PLATE 30.

SOUTH ROOKERY BERING ISLAND FEMALES AND PUPS. AUGUST 17 1895

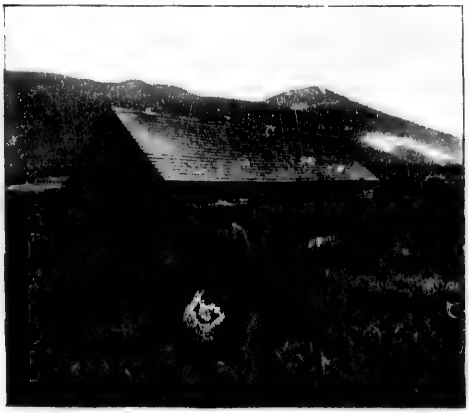


a.—Western half.



b.—Eastern half.

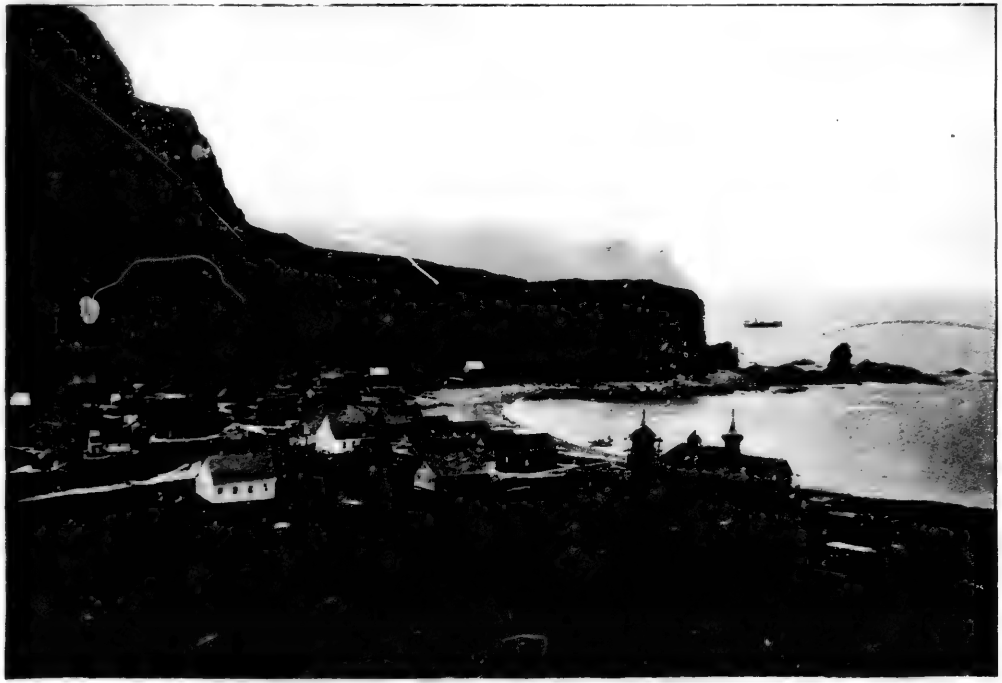
SOUTH ROOKERY, BERING ISLAND. REDUCED COPIES OF PHOTOGRAPHS BY COLONEL VOLOSHINOF, TO SHOW DISTRIBUTION OF SEALS IN 1885. NEARLY SAME STANDPOINT AS PLATE 29.



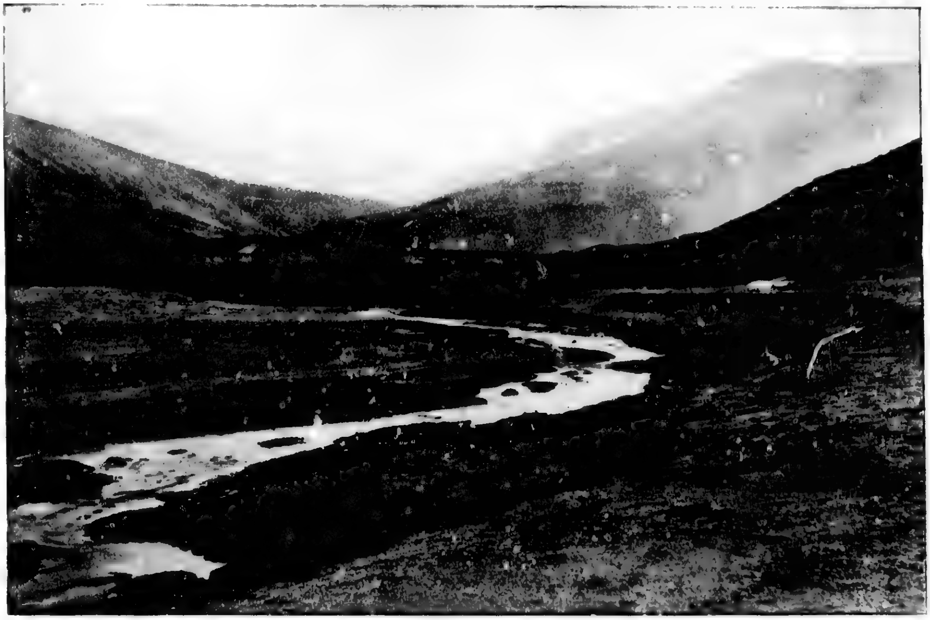
a.—SALT-HOUSE, SOUTH ROOKERY, BERING ISLAND.

b. WATERFALL AT SOUTH ROOKERY, BERING ISLAND.

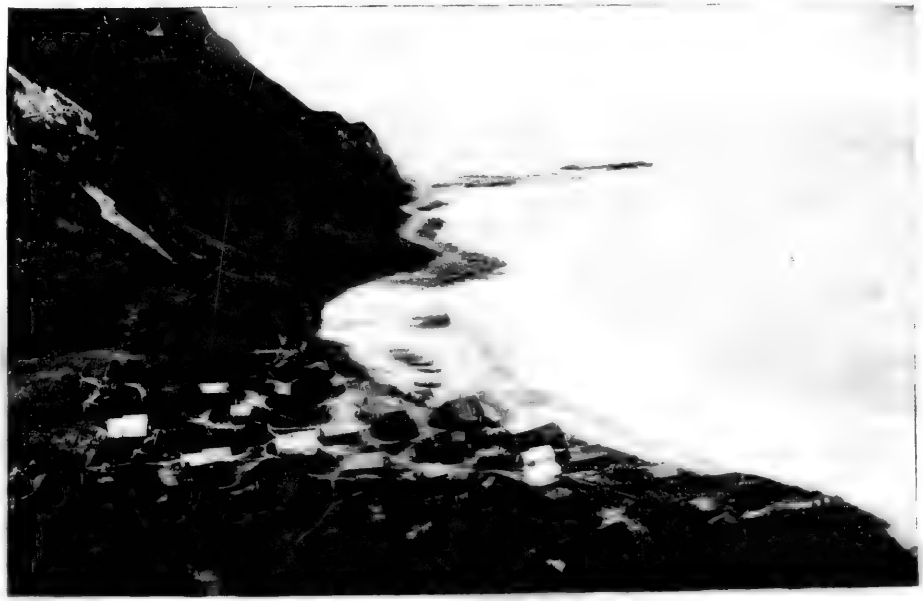
PLATE 33.



PREOBRAZHENSKOYE VILLAGE   COPPER ISLAND

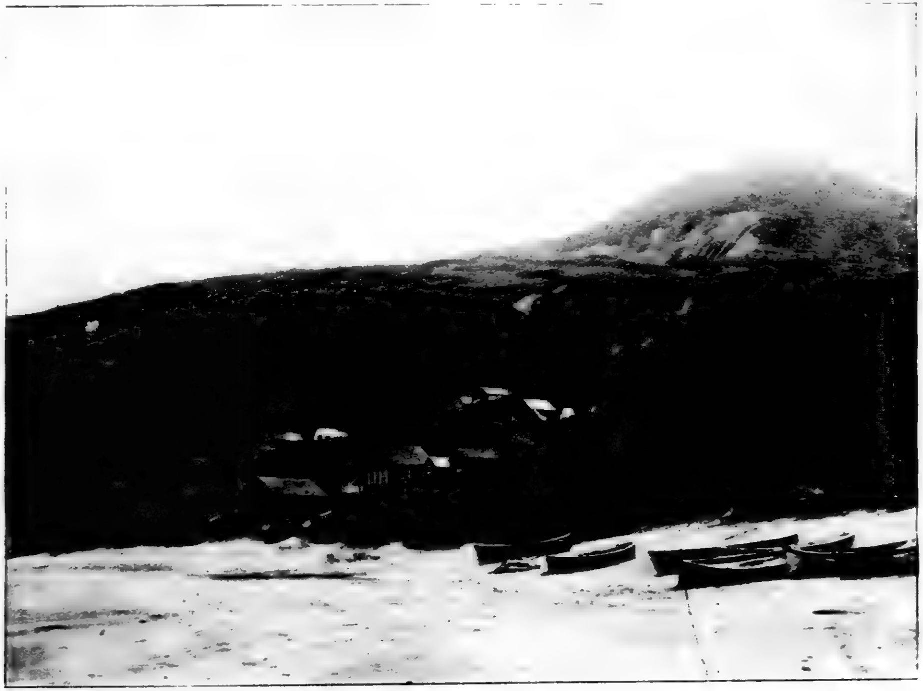


a.—KARABELNI VILLAGE, COPPER ISLAND

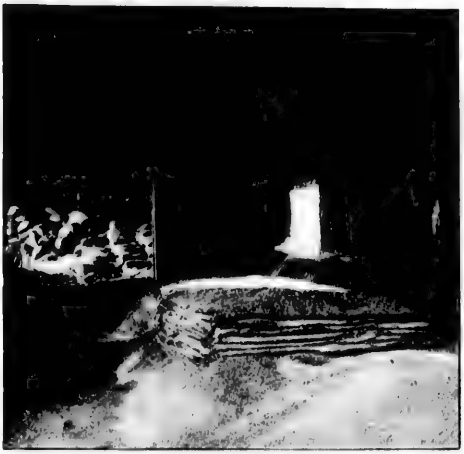


b.—GLINKA VILLAGE, COPPER ISLAND, FROM HILL.

PLATE 35.



GLINKA VILLAGE, COPPER ISLAND FROM THE BEACH

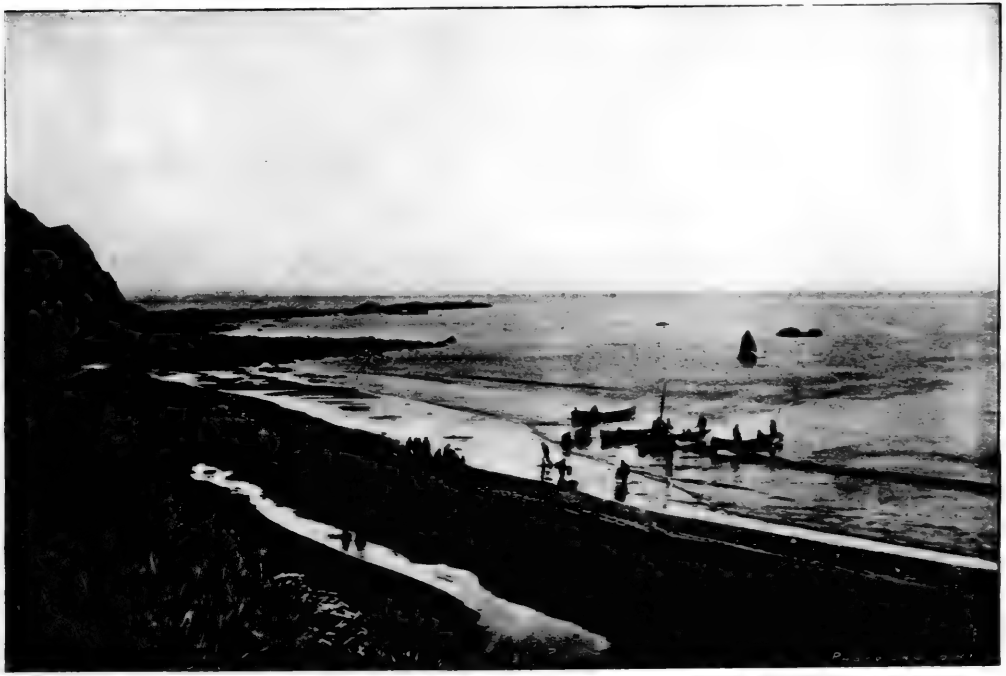


a.—Seal skins in salt

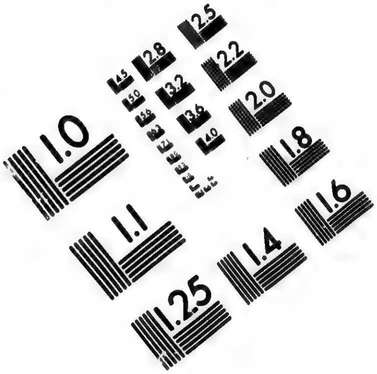
b.—Seal skins bundled, ready for shipment.

INTERIOR OF SALT-HOUSE, GLINKA, COPPER ISLAND

PLATE 37.



GLINKA. COPPER ISLAND NATIVES RETURNING TO THE MAIN VILLAGE.



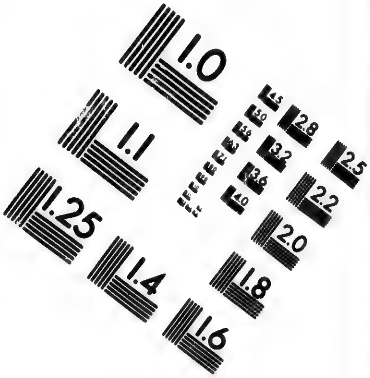
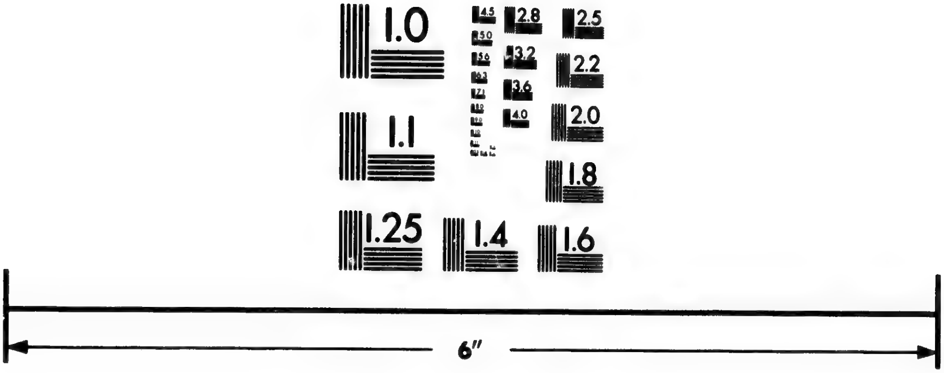
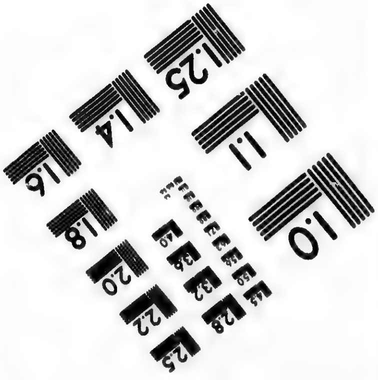


IMAGE EVALUATION TEST TARGET (MT-3)





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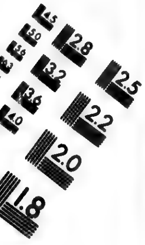
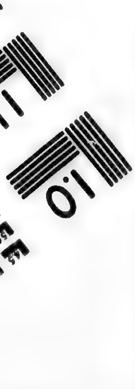
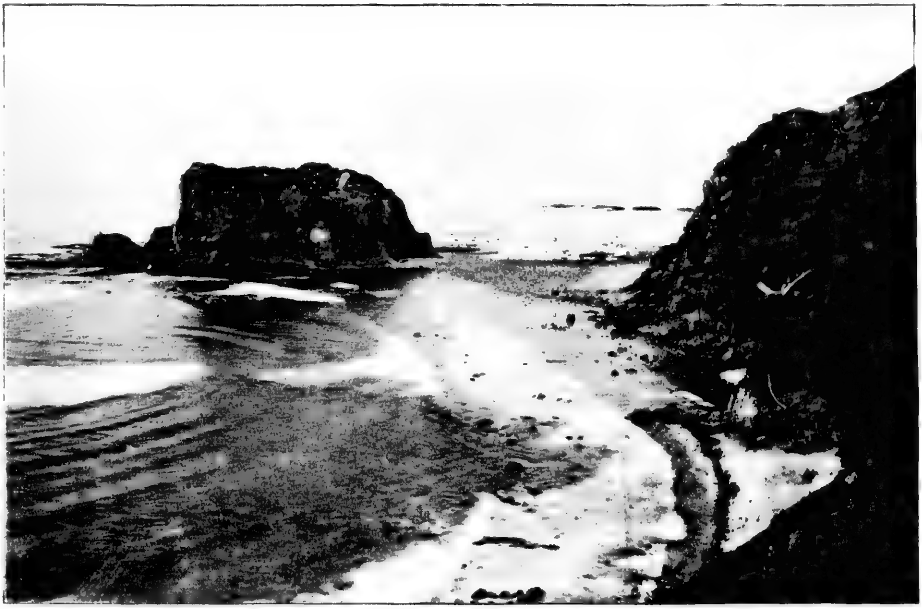


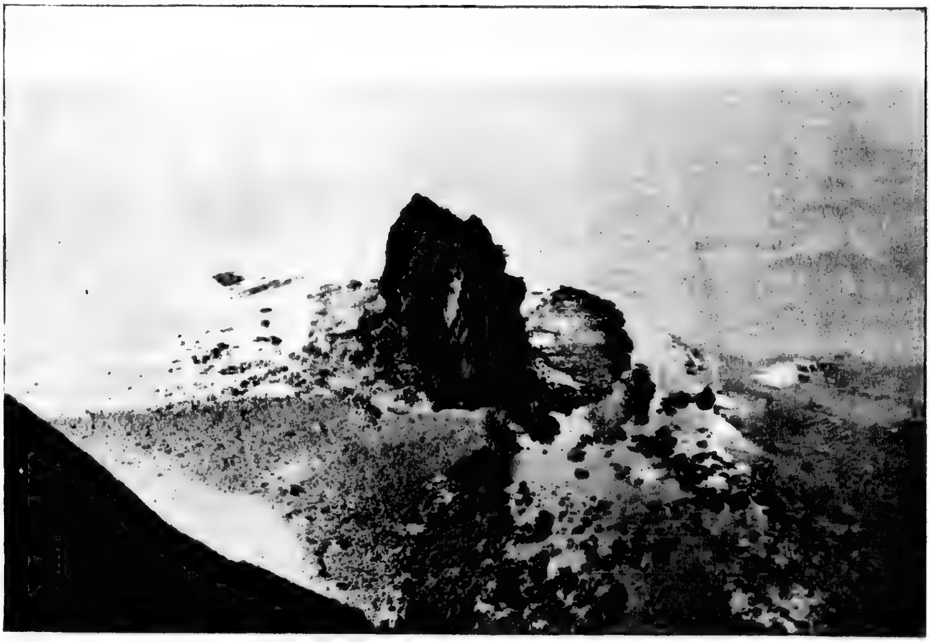
4.5
2.8
5.0
2.5
3.2
3.6
2.2
4.0
2.0
1.8



1.1
1.0



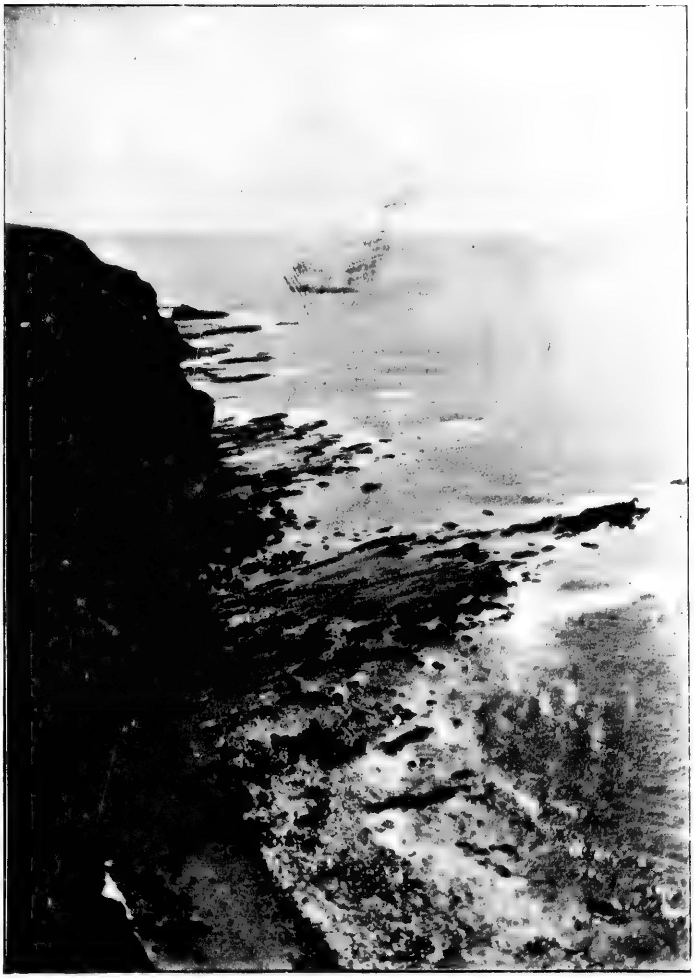
a.—From Photographic Station No. 4 (Map, plate 12). August 1, 1895.



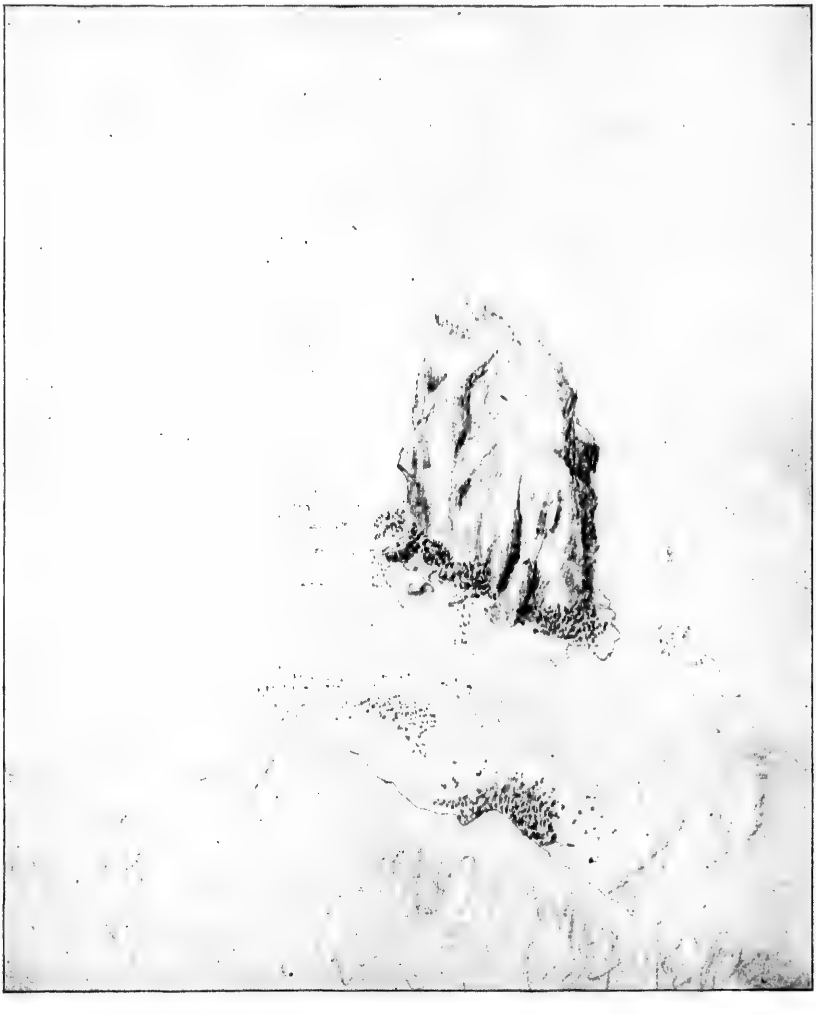
b.—From Photographic Station No 1, August 2, 1895.

KARABELNI STOLP, KARABELNOYE ROOKERY, COPPER ISLAND.

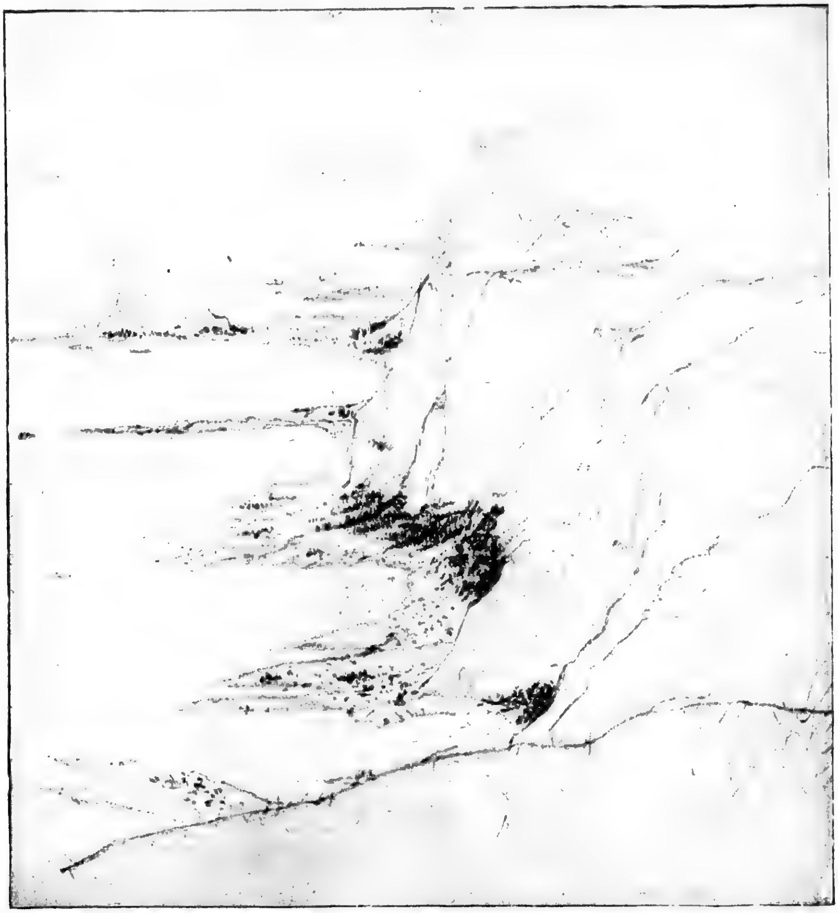
KARABELNOYE ROOKERY, COPPER ISLAND, LOOKING WEST TOWARD KARABELNI STOLP, FROM PHOTOGRAPHIC STATION No. 3 (MAP, PLATE 12). AUGUST 1, 1895.



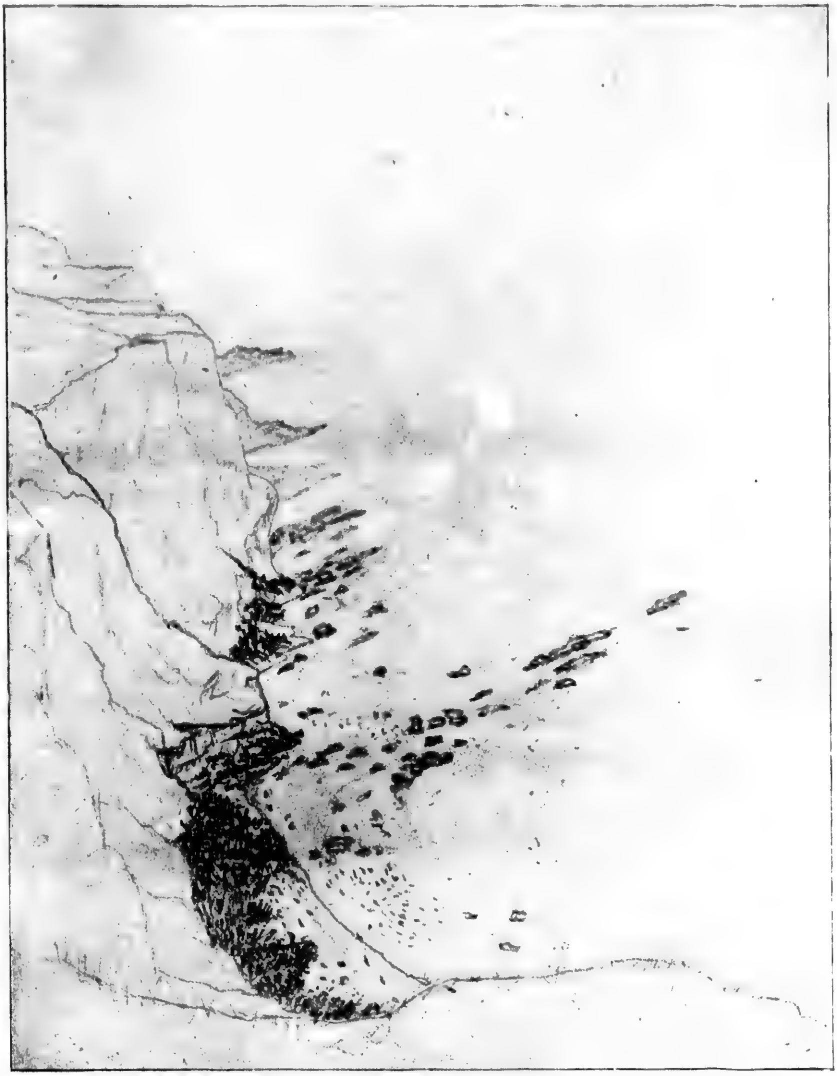
KARABELNOYE ROOKERY, COPPER ISLAND, LOOKING EAST TOWARD VODOPADSKI MYS. FROM PHOTOGRAPHIC STATION No. 2 (MAP, PLATE 12). AUGUST 1, 1895



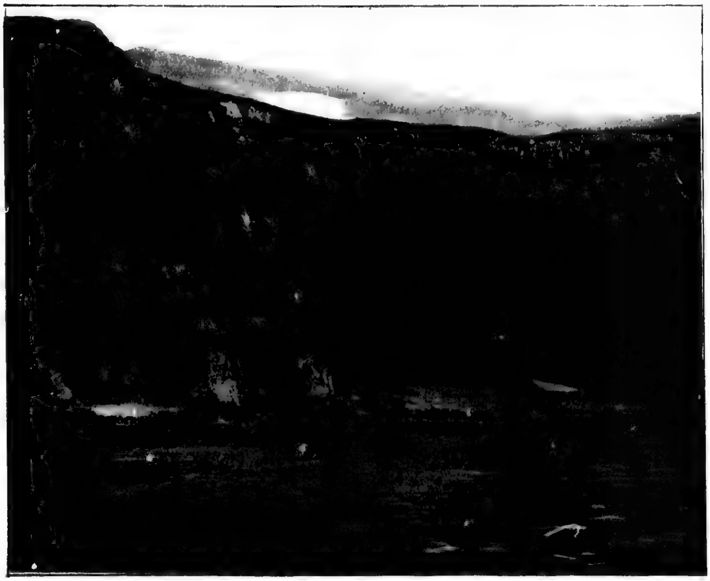
KARABELNI STOLP, COPPER ISLAND. FACSIMILE OF PENCIL SKETCH BY THE AUTHOR, JULY 3, 1883, FROM PHOTOGRAPHIC STATION No. 1 (PLATE 38*b*), TO SHOW DISTRIBUTION OF SEALS.



KARABELNOYE ROOKERY, COPPER ISLAND. FACSIMILE OF PENCIL SKETCH BY THE AUTHOR, JULY 3, 1883, FROM PHOTOGRAPHIC STATION No. 3 (PLATE 39), TO SHOW DISTRIBUTION OF BREEDING SEALS.

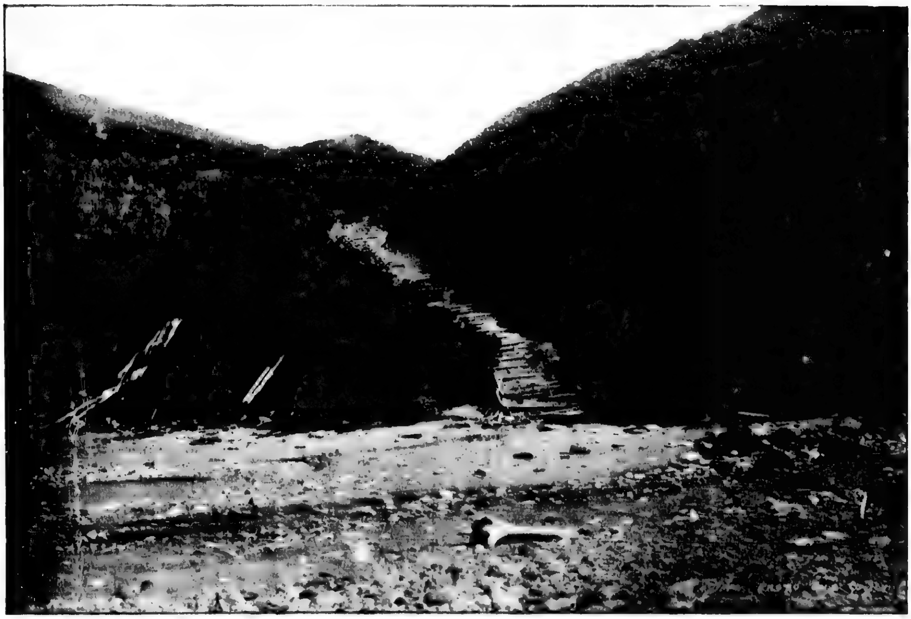


KARABELNOYE ROOKERY, COPPER ISLAND. FACSIMILE OF PENCIL SKETCH BY THE AUTHOR, JULY 3, 1883, FROM PHOTOGRAPHIC STATION No. 2 (PLATE 40), TO SHOW DISTRIBUTION OF BREEDING SEALS.



a. – Bolshaya Bukhta, from extreme end of Karabelni Stolp.

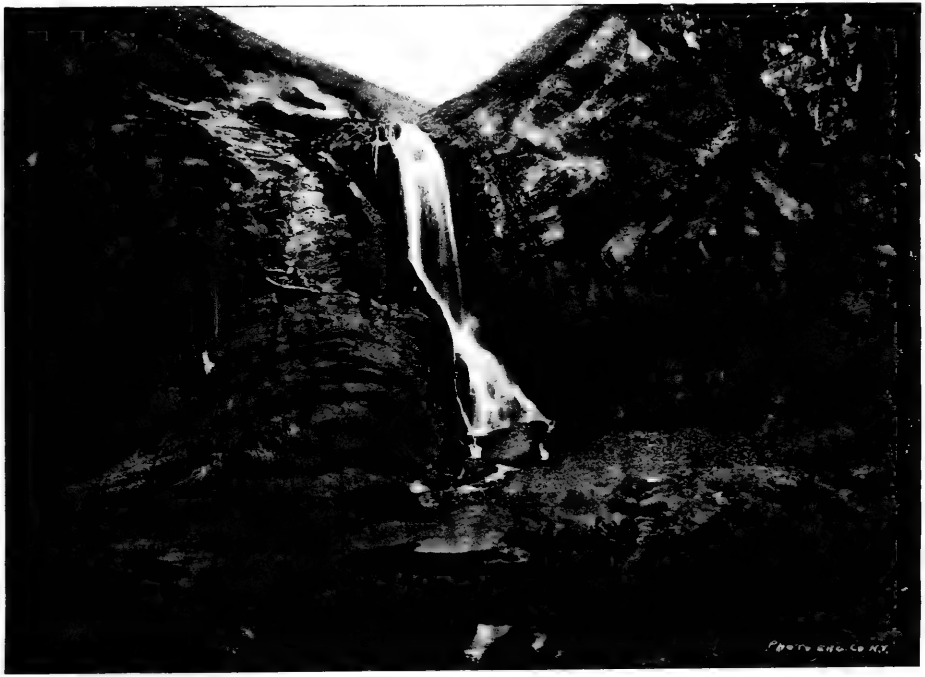
From a photograph by N. Grebnitski, August 1, 1895.



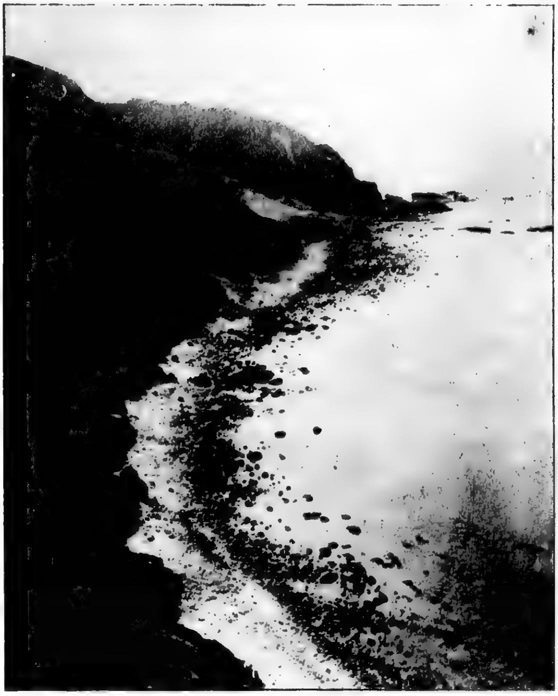
b.—Drive steps, Stolbovaya Bukhta, from Photographic Station No. 5 (Map, plate 12)

KARABELNOYE ROOKERY, COPPER ISLAND.

PLATE 45.

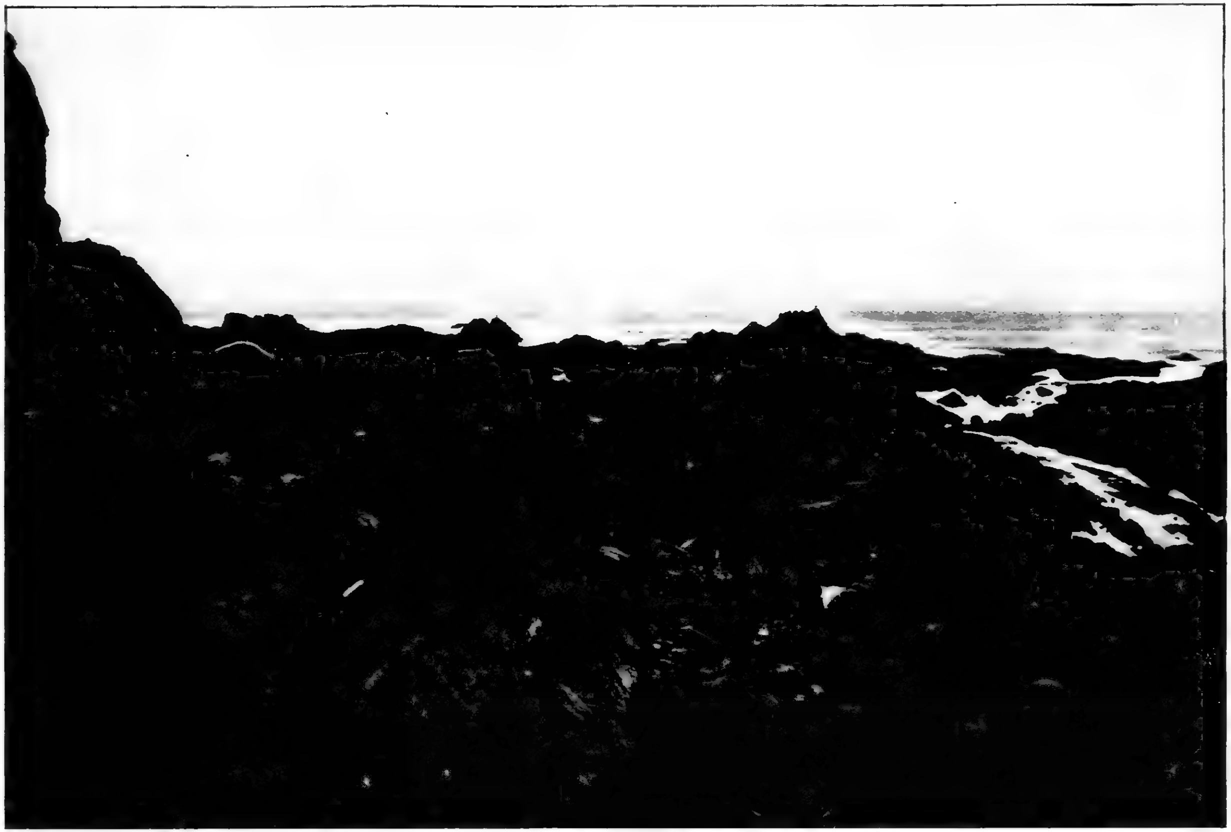


DRIVE STEPS AND WATERFALL, VODOPAD. KARABELNOYE ROOKERY. COPPER ISLAND.



PALATA, COPPER ISLAND, FROM ZAPADNI.

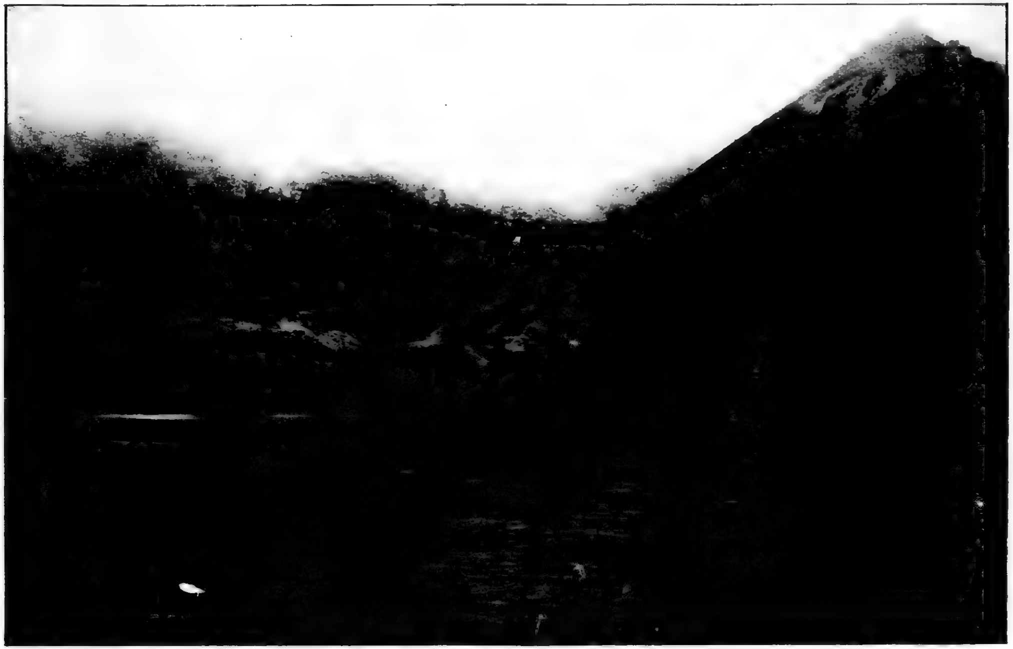
From a photograph by N. Grebnitski, August 7, 1895.



PALATA REEF, COPPER ISLAND.

Photograph by N. B. Miller, June 4, 1892.

PLATE 48.

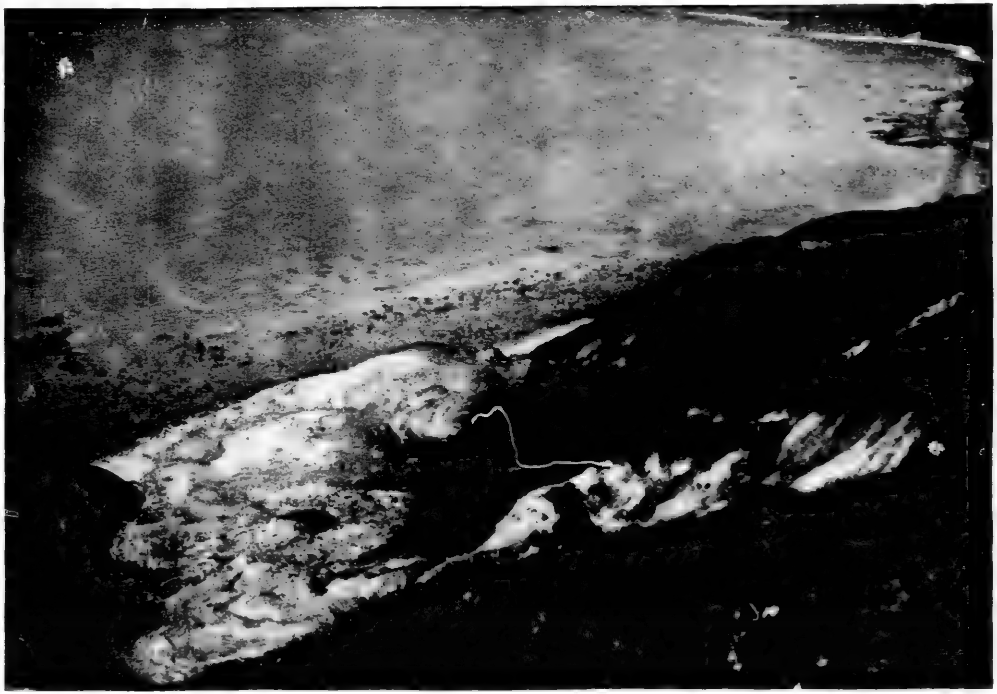


PALATA ROOKERY, COPPER ISLAND, FROM A ROCK OFF THE ROOKERY, LOOKING UP THE GULLY. AUGUST 2, 1895.

PLATE 49.

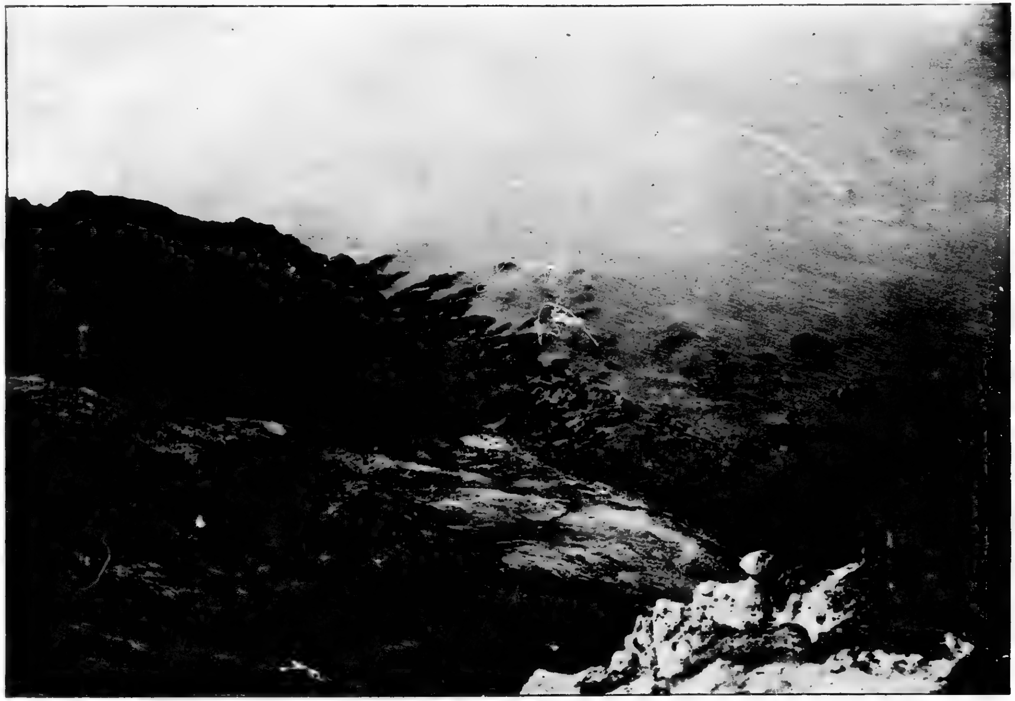
PALATA ROOKERY, COPPER ISLAND, FROM SAME STANDPOINT AS PLATE 48, LOOKING TOWARD SABATCHA DIRA. AUGUST 2, 1895.

PLATE 50.



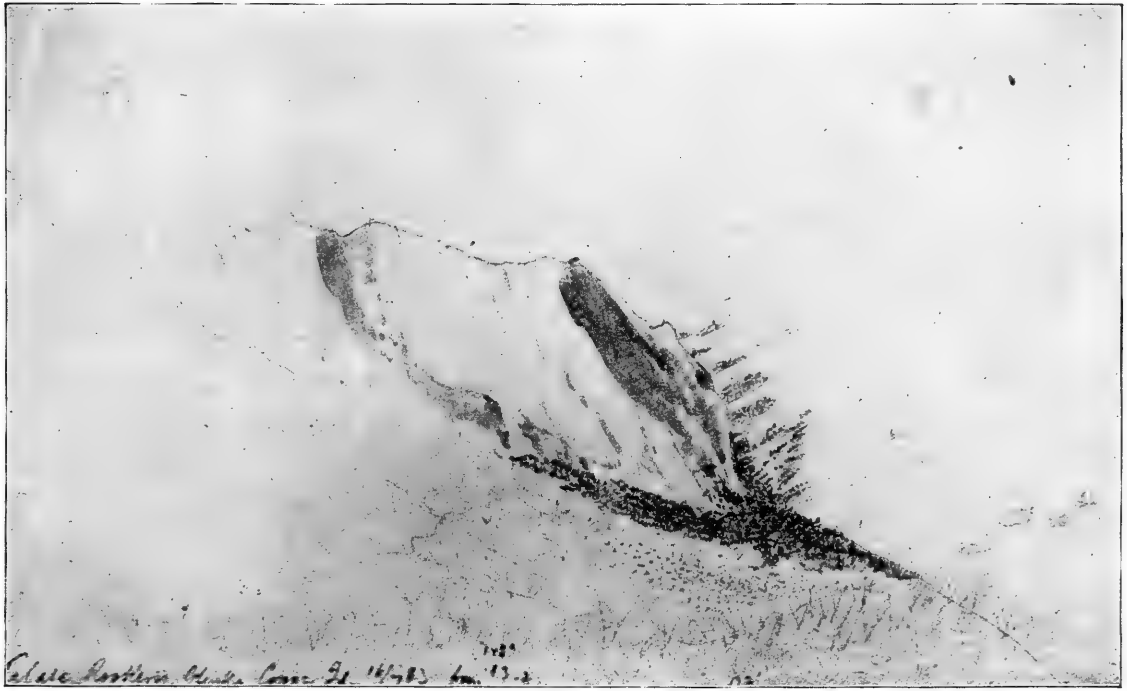
PALATA ROOKERY, COPPER ISLAND, FROM NEARLY SAME STANDPOINT AS PLATE 55, LOOKING DOWN THE GULLY. AUGUST 7, 1895.

PLATE [illegible].



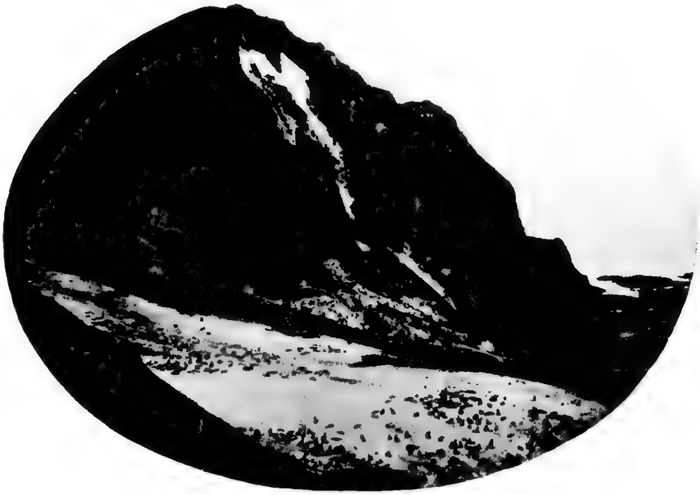
PALATA ROOKERY, COPPER ISLAND, FROM HILL MARKED "806" FEET ON MAP. PLATE 101. AUGUST 7, 1895.

PLATE 52.

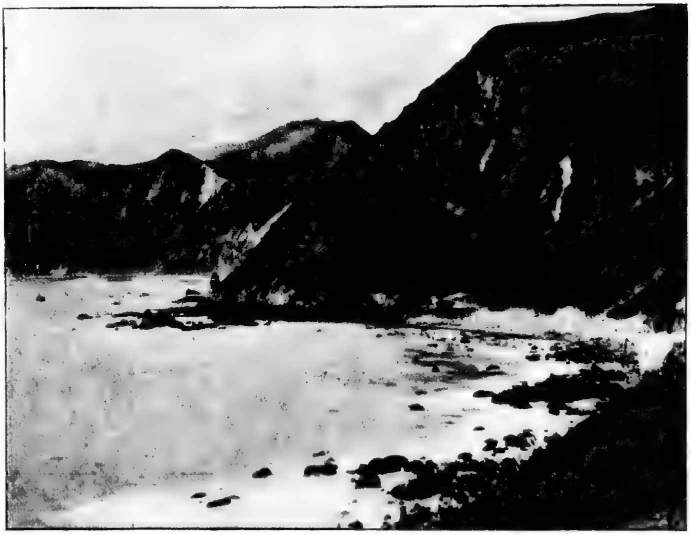

Palata Rookerie Glinka Copper Is 16/7/83

PALATA ROOKERY, GLINKA, COPPER ISLAND.

Sketch by the author, July 16, 1883. From same standpoint as plate 51.

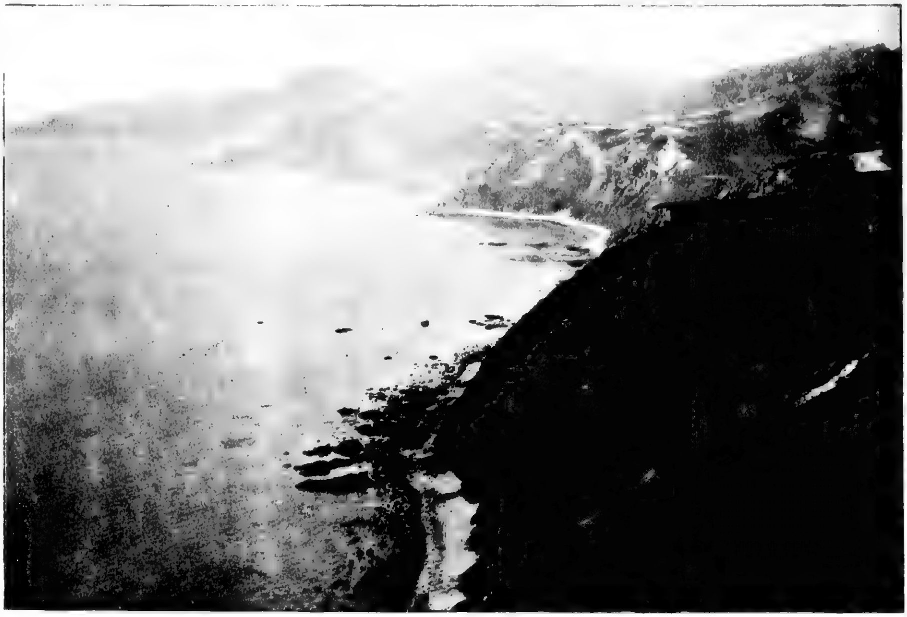


a. Palata Rookery, Copper Island. Same standpoint as 69

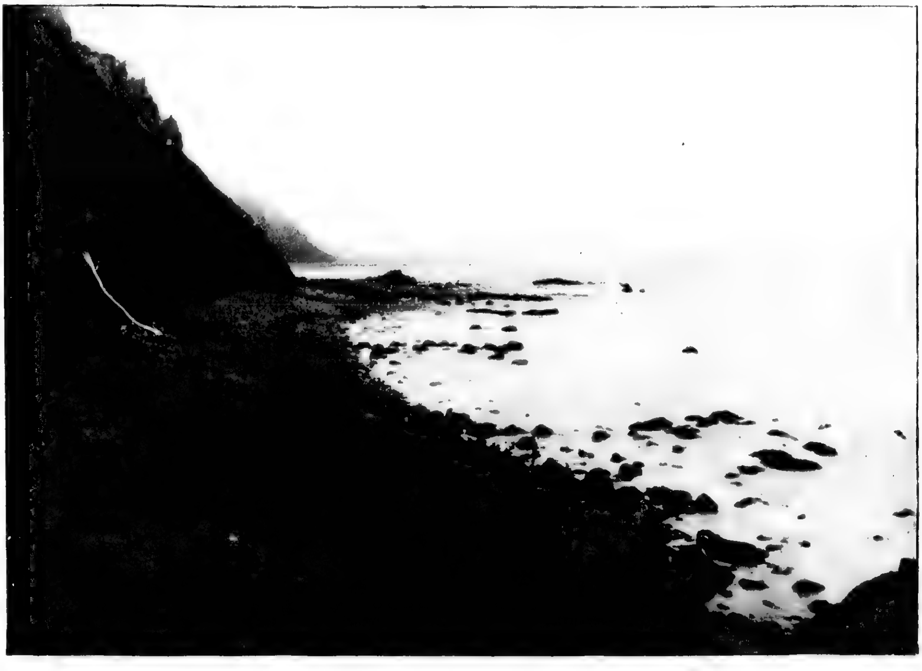


b. —Zapadni Rookery, Copper Island. Standpoint lower down than plate 54*a*. Same standpoint as plate 72.

FROM PHOTOGRAPHS BY COLONEL VOLOSHINOF, TO SHOW DISTRIBUTION OF SEALS IN 1885.

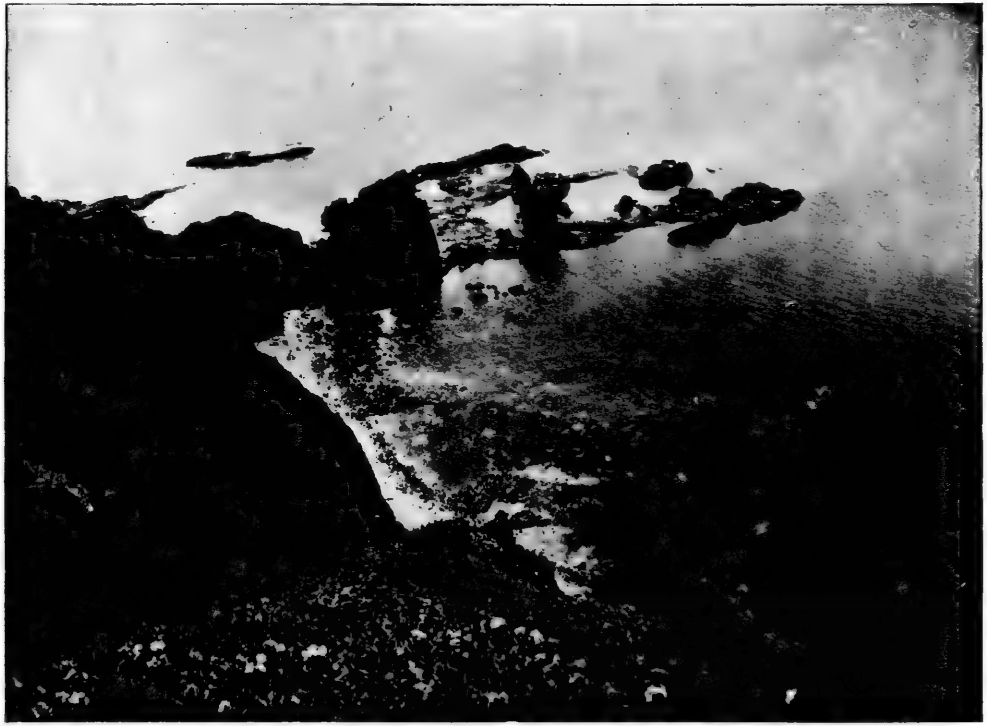


a.—ZAPADNI ROOKERY, COPPER ISLAND, FROM SAME POINT AS PLATE 51. AUGUST 7, 1895.



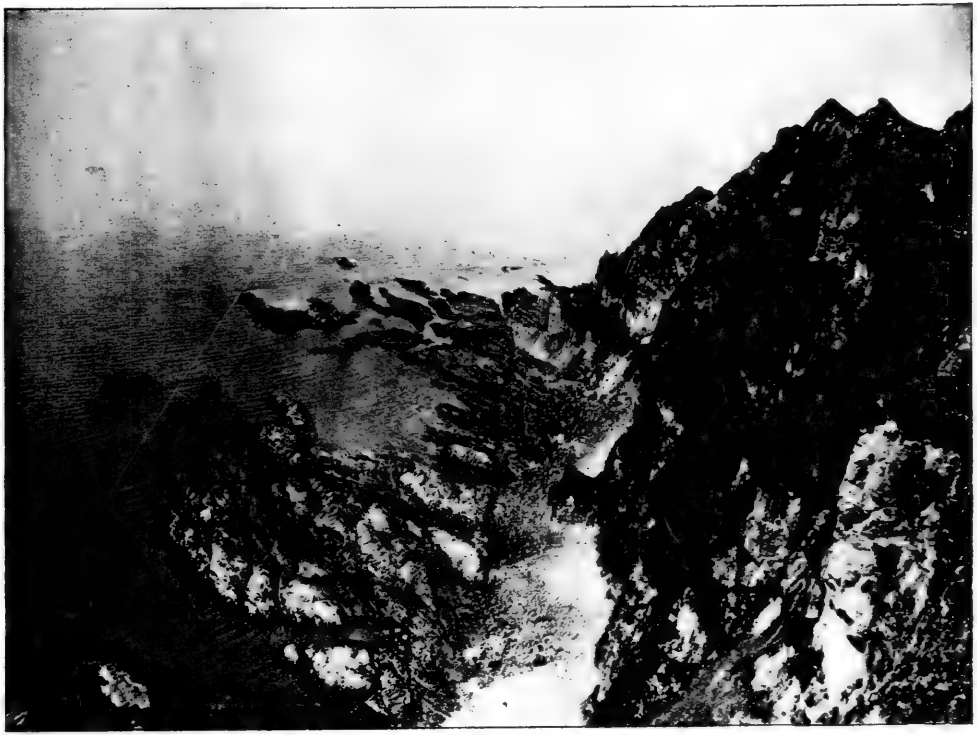
b.—URILI KAMEN ROOKERY, COPPER ISLAND, FROM PERESHEYEK. AUGUST 3, 1895.

PLATE 55.

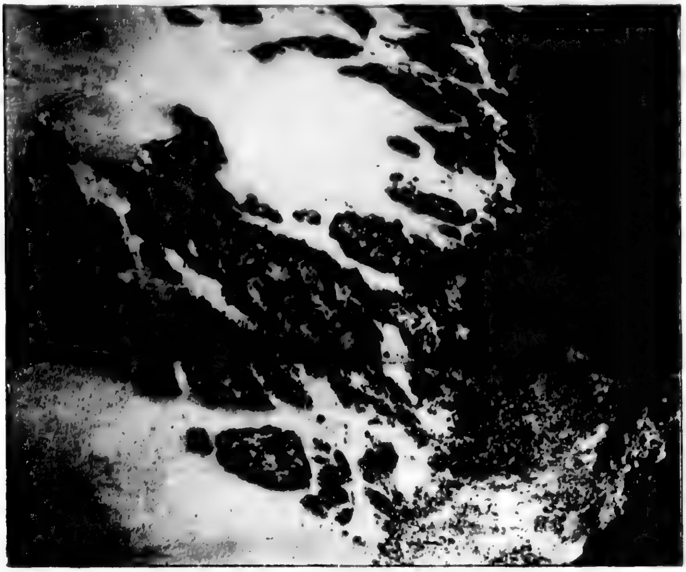


ZAPALATA ROOKERY, COPPER ISLAND, LOOKING EAST TOWARD STOLBI. AUGUST 7. 1895.

PLATE 56.



ZAPALATA ROOKERY, COPPER ISLAND, LOOKING WEST TOWARD END OF PALATA, FROM SAME POINT AS PLATE 55. AUGUST 7. 1895



a.—ZAPALATA ROOKERY, COPPER ISLAND, FROM A PHOTOGRAPH BY COLONEL VOLOSHINOF TO SHOW DISTRIBUTION OF SEALS IN 1885. SAME STANDPOINT AS PLATE 56.

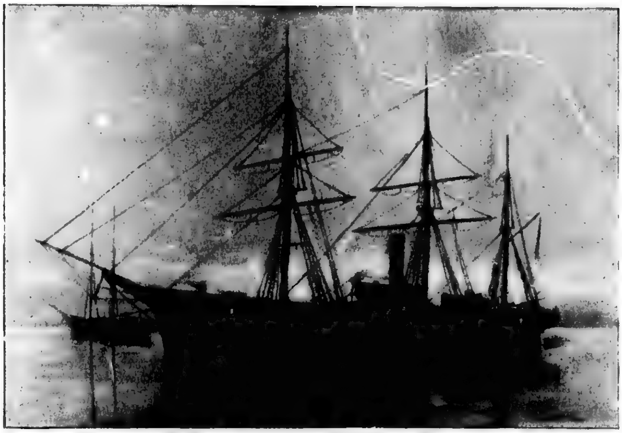
b.—SIKATCHINSKAYA BUKHTA ROOKERY, COPPER ISLAND, FROM A ROCK OFF THE ROOKERY.

Photograph by N. Grebnitski, August 2, 1895.

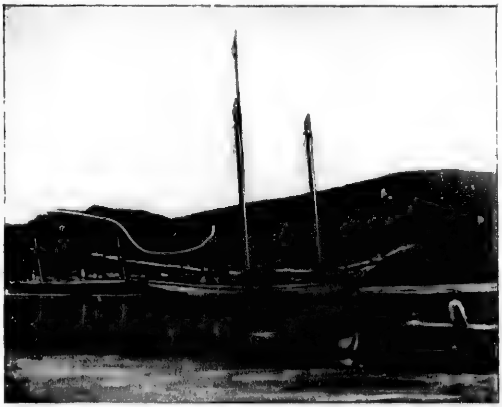
a.—DRIVEWAY FROM ZAPADNI ROOKERY, COPPER ISLAND. LOOKING DOWN THE VALLEY. AUGUST 8, 1895.

b.—DRIVEWAY FROM PESTSHANI HAULING-GROUNDS, COPPER ISLAND.

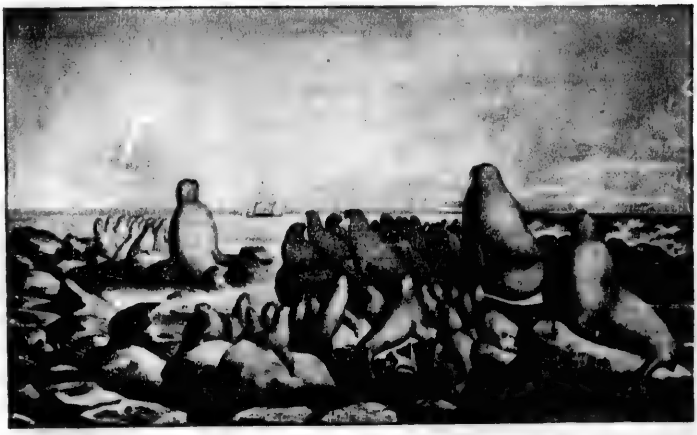
c.—PESTSHANI SALT-HOUSE, NEAR GLINKA VILLAGE, COPPER ISLAND.



a.—HUTCHINSON, KOHL, PHILIPPEUS & CO.'S STEAMER ALEKSANDER II.

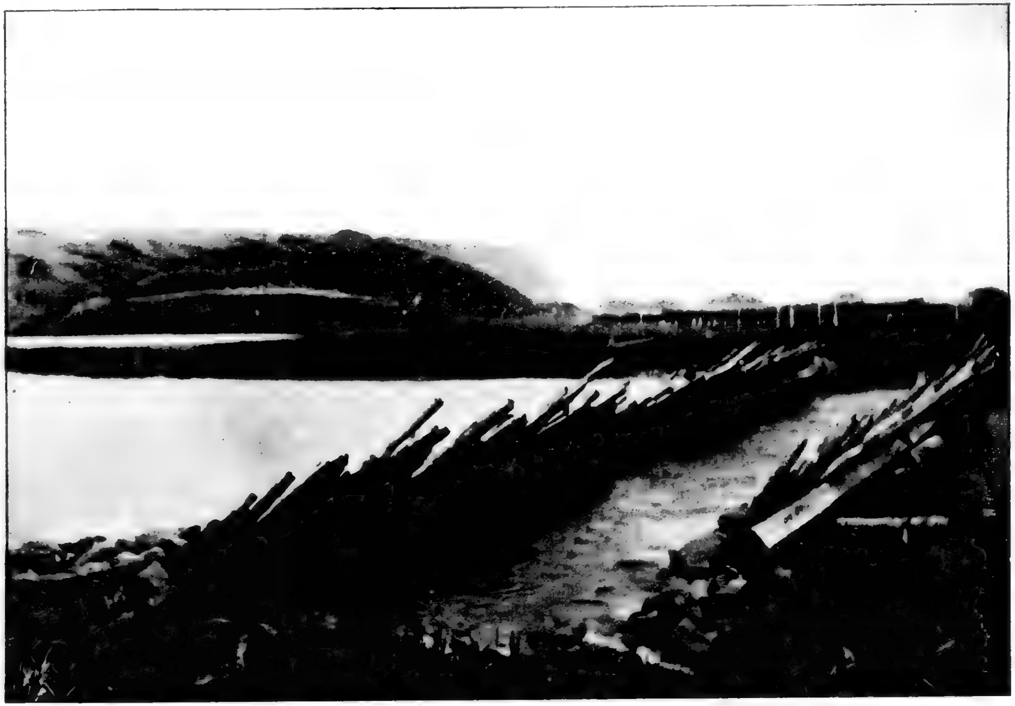


b.—RUSSIAN SEAL SKIN COMPANY'S SCHOONER BOBRIK, CAPT. D. GRŒNBERG.

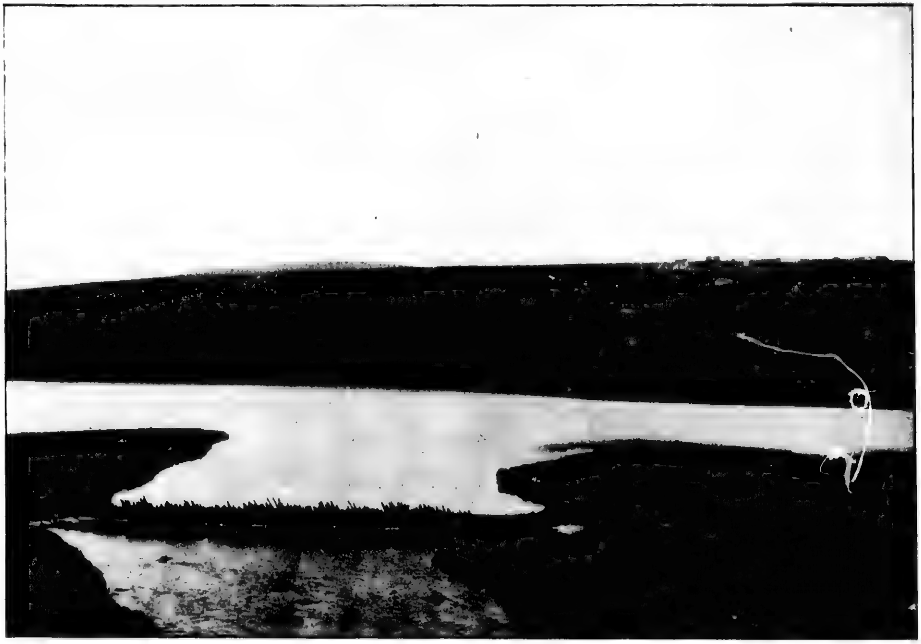


c.—REDUCED COPY OF CHORIS'S PICTURE OF FUR SEALS. VOY. PITT. AUT. MONDE, PLATE XV (1822).

PLATE 60.



SALMON WEIR (ZAPORR), SARANNA RIVER, BERING ISLAND.



a.—Western half, with salmon weir.

b.—Eastern half, with scaffolding for drying salmon.

SARANNA VILLAGE, BERING ISLAND.

a.—Native dragging along a seal which is too tired to move.

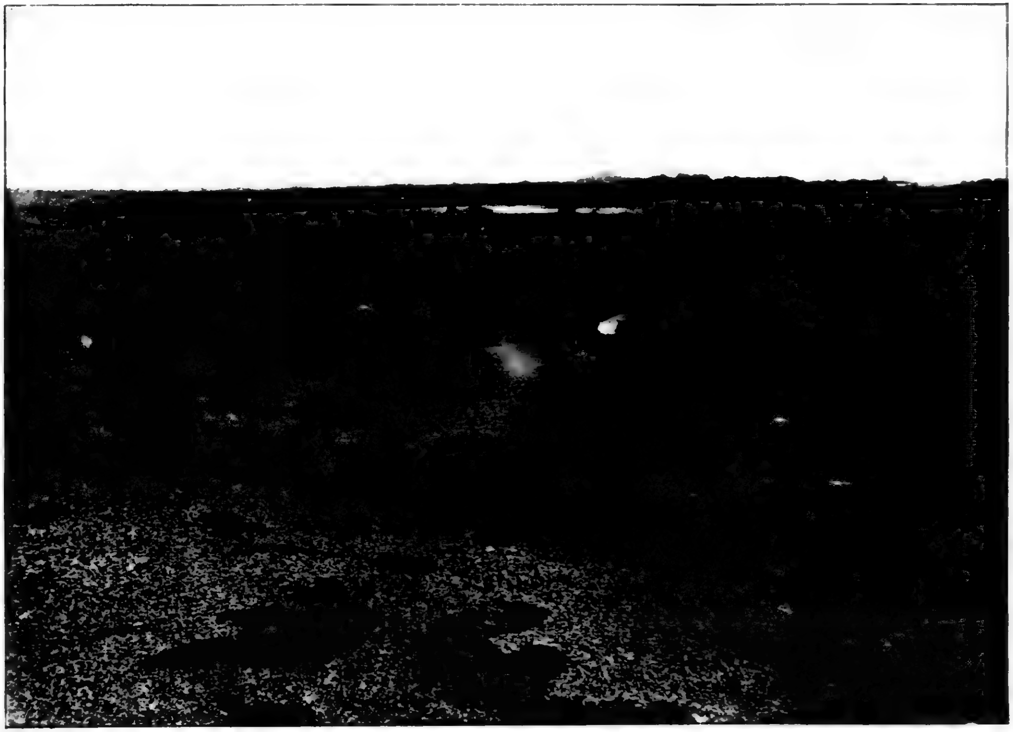
b.—A baby skin-carrier.

DRIVE FROM ZAPADNI, COPPER ISLAND, AUGUST 8, 1895; EARLY MORNING; DRIZZLING RAIN

a.—SALT-HOUSE AT POPOFSKI, NEAR KARABELNI VILLAGE, COPPER ISLAND.

b.—SEALS SLIDING DOWN THE LAST EMBANKMENT, GLINKA VILLAGE, COPPER ISLAND. DRIVE AUGUST 8, 1895.

PLATE 64.

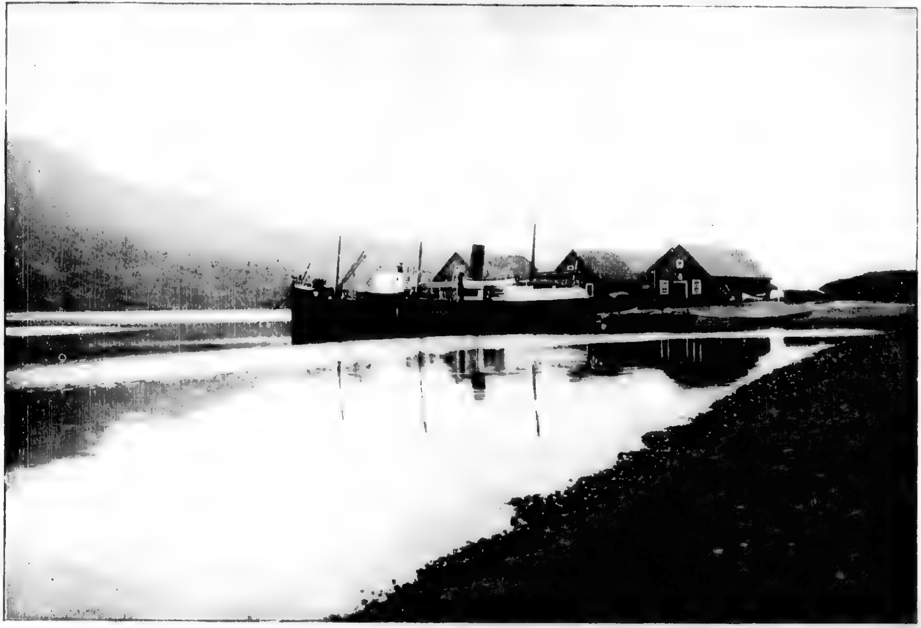


DEAD SEAL PUPS IN WINDROWS, REEF. NORTH ROOKERY, BERING ISLAND, SEPTEMBER 16, 1895.

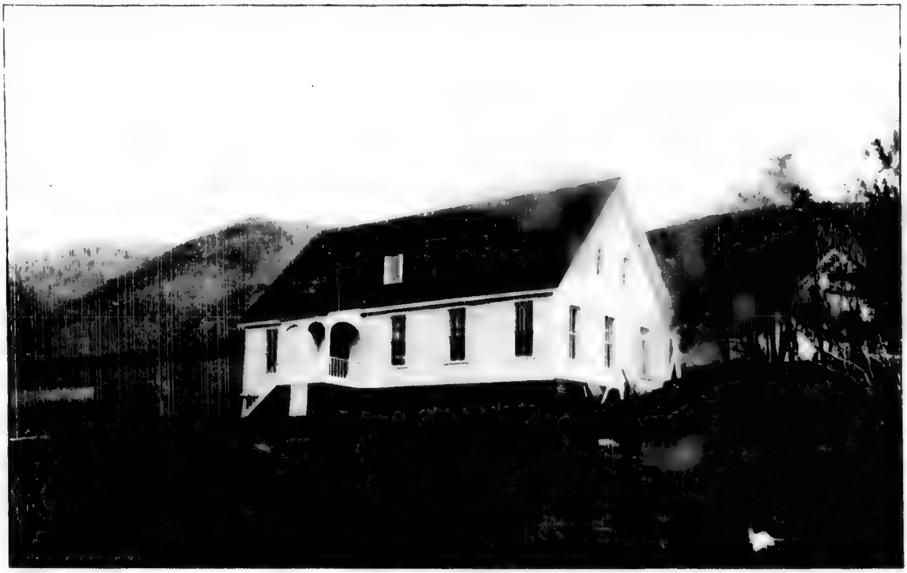
a.—From hill behind the town.

b.—From Russian Seal Skin Company's wharf.

PETROPAULSKI, KAMCHATKA.

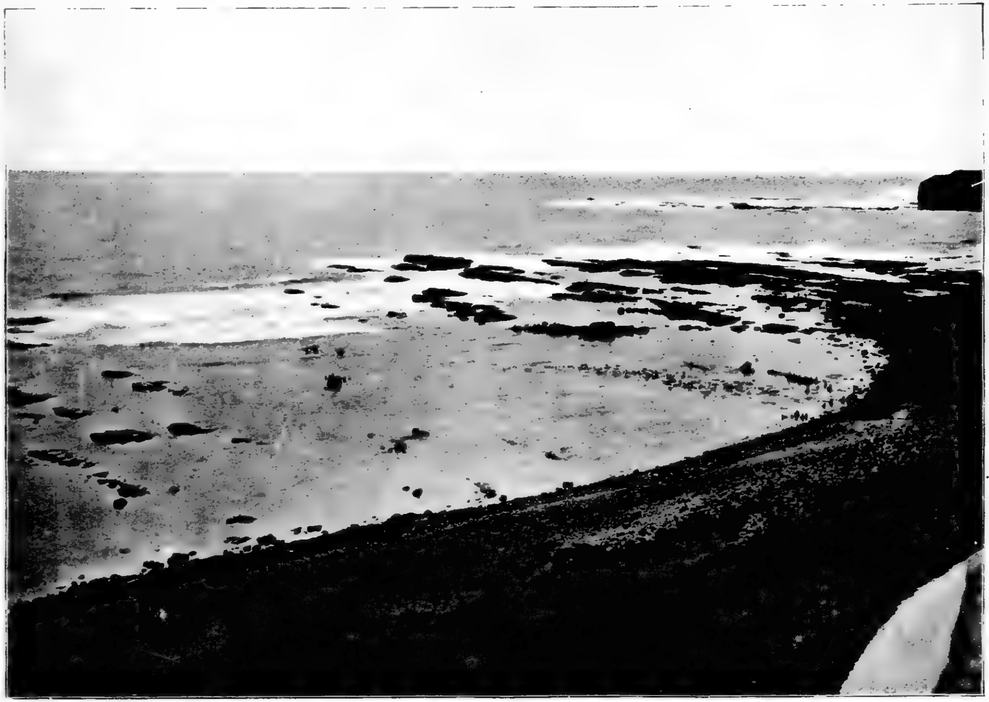


a. Russian Seal Skin Company's wharf, magazines and steamer Kotik, Capt. C. E. Lindquist



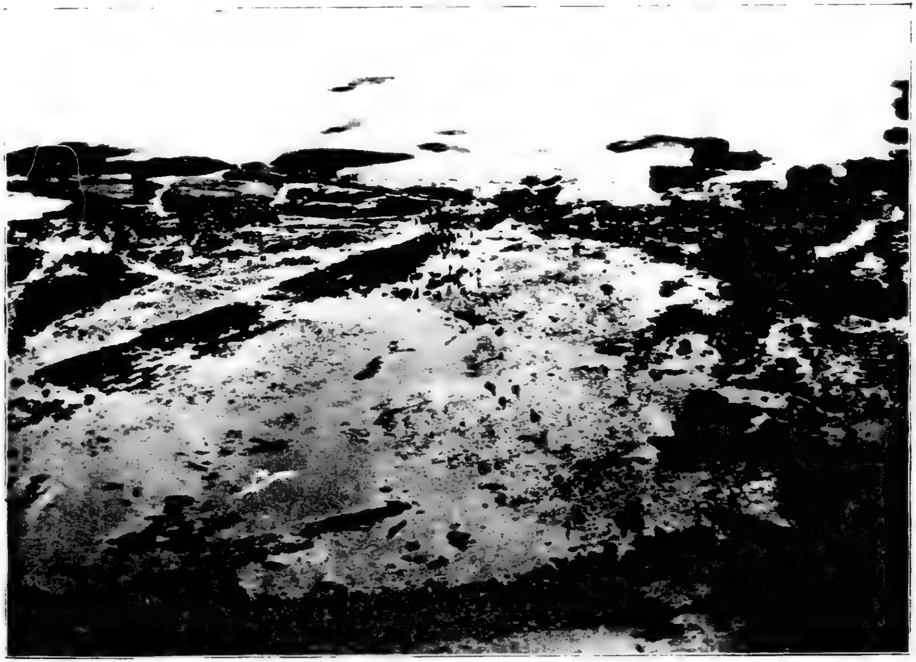
b.—Headquarters of Russian Seal Skin Company.

PETROPAULSKI, KAMCHATKA.

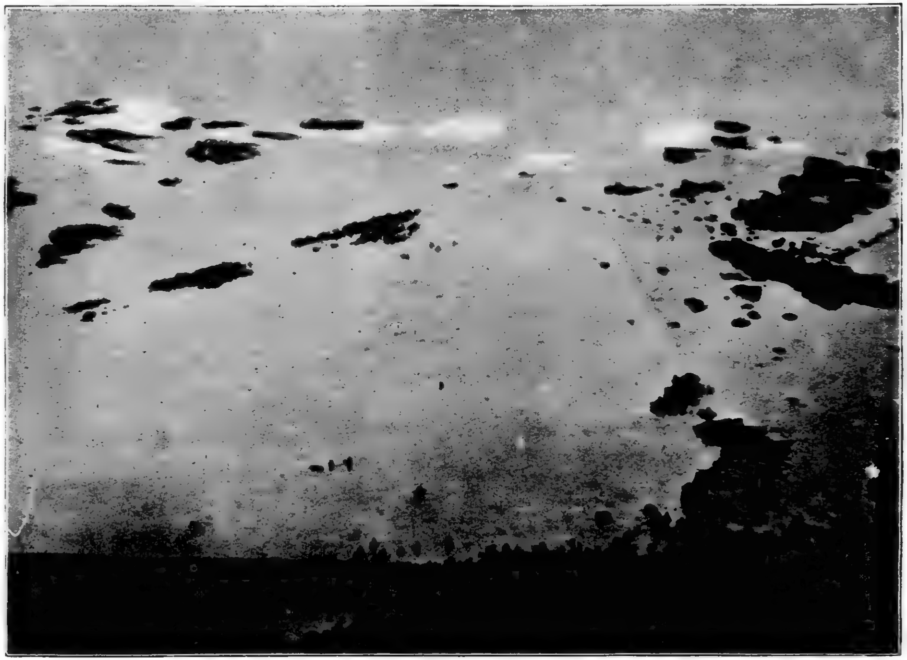


SOUTH ROOKERY, BERING ISLAND. FROM SAME STANDPOINT AS COLONEL VOLOSHINOF'S PHOTOGRAPHS, 1885. JULY 24, 1897, 2.15 P. M.

PLATE 68.



SOUTH ROOKERY, BERING ISLAND LOW WATER, SHOWING CONDITIONS AT TIME OF CENSUS OF 1897. FROM STATION No. 5.
JULY 28, 1897, 10.20 A. M.



SOUTH ROOKERY, BERING ISLAND. HIGH WATER, SHOWING CONDITIONS AT TIME OF CENSUS OF 1897. FROM STATION No. 5. JULY 25, 1897.

PALATA ROOKERY, GLINKA, COPPER ISLAND. FROM NEARLY THE SAME STANDPOINT AS PLATE 51. AUGUST 6, 1896, 9 50 A. M.

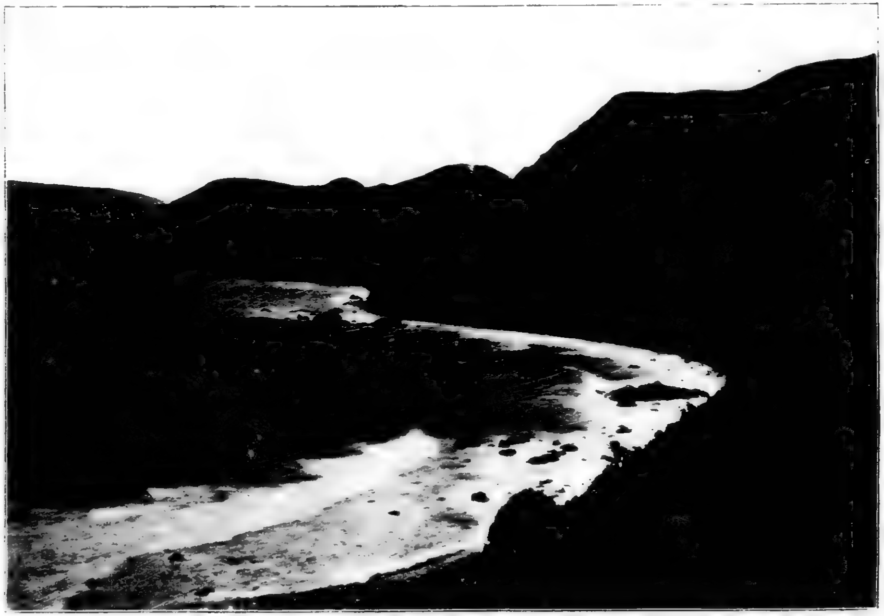
PLATE 71.

ZAPADNI ROOKERY, GLINKA, COPPER ISLAND. FROM NEARLY THE SAME STANDPOINT AS PLATE 54*a*. AUGUST 6, 1896 9 30 A M.

PLATE 72.

PALATA ROOKERY, GLINKA COPPER ISLAND. FROM COLONEL VOLOSHINOF'S PHOTOGRAPH OF 1885 (PLATE 53*a*).
AUGUST 21, 1897

PLATE 73.



ZAPADNI ROOKERY, GLINKA, COPPER ISLAND. FROM COLONEL VOLOSHINOF'S PHOTOGRAPH OF 1885 (PLATE 53*b*).
AUGUST 21, 1897.

PLATE 74.

ZAPALATA ROOKERY GLINKA, COPPER ISLAND. LOOKING TOWARD STOLBI, FROM NEARLY SAME STANDPOINT AS PLATE 55.
AUGUST 21, 1897

PLATE 75.

SIKATCHINSKAYA BUKHTA, GLINKA, COPPER ISLAND. LOOKING TOWARD STOLBI, FROM SAME STANDPOINT AS PLATE 12
AUGUST 6, 1896 11 A M

PLATE 76.

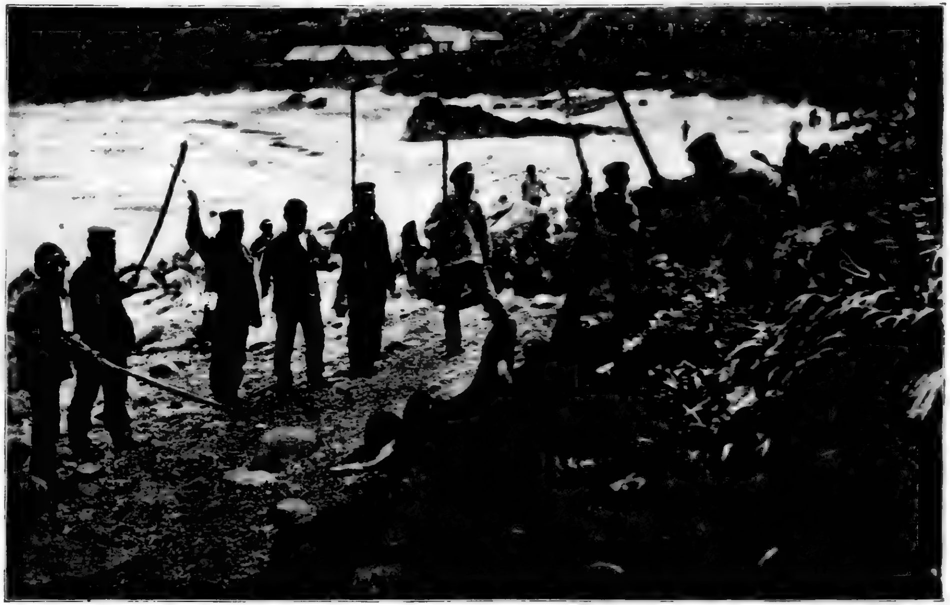
GAVARUSHKAYA BUKHTA. GLINKA. COPPER ISLAND FROM TOP OF WATERFALL AUGUST 21, 1897, 1 P M.

Plate 77.

DRIVE AT GLINKA VILLAGE, COPPER ISLAND SHOWING DIVISION OF THE HERD INTO A NUMBER OF SEPARATE DETACHMENTS.

Photograph by N. N. Lukin-Feodotitch, 1895.

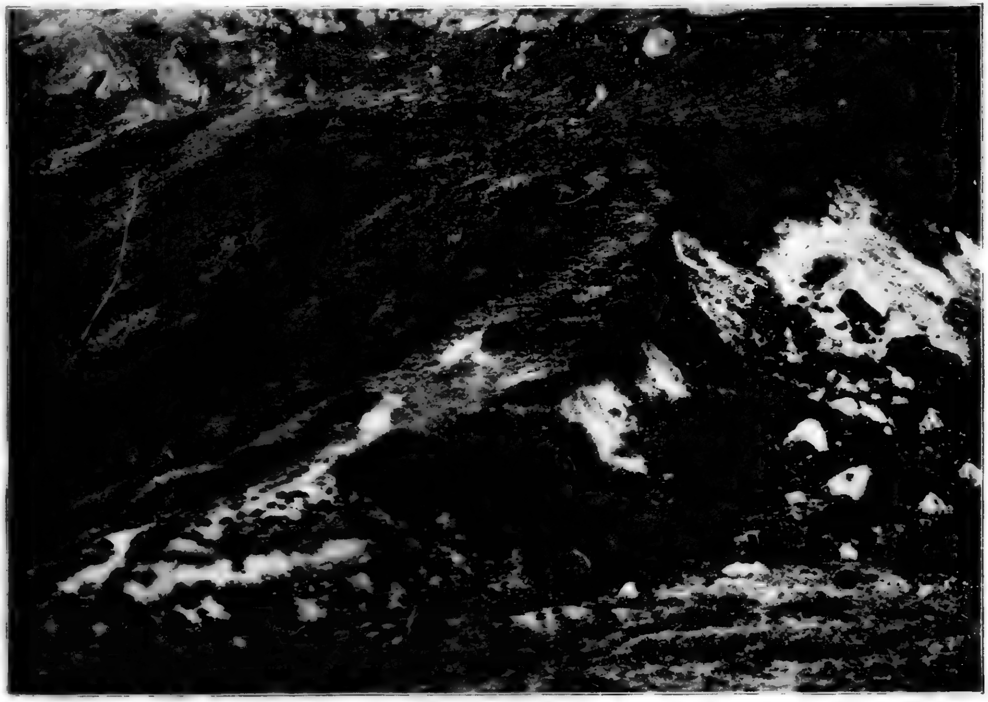
PLATE 78.



KILLING SEALS IN FRONT OF GLINKA VILLAGE, COPPER ISLAND

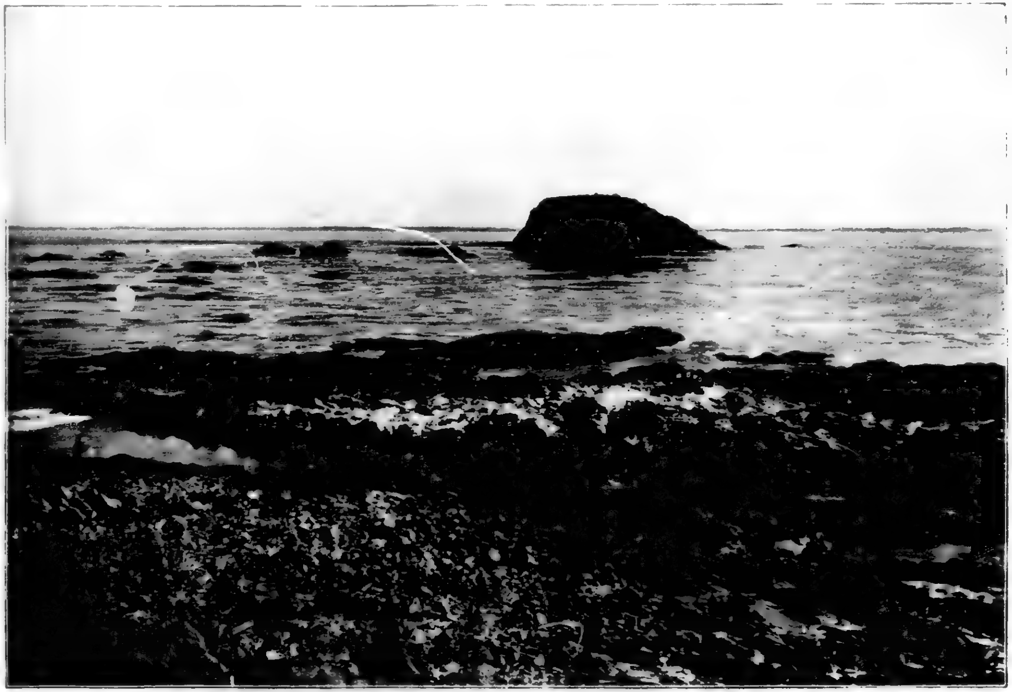
Photograph by N. N. Lukin-Feodotitch, 1895.

PLATE 79.



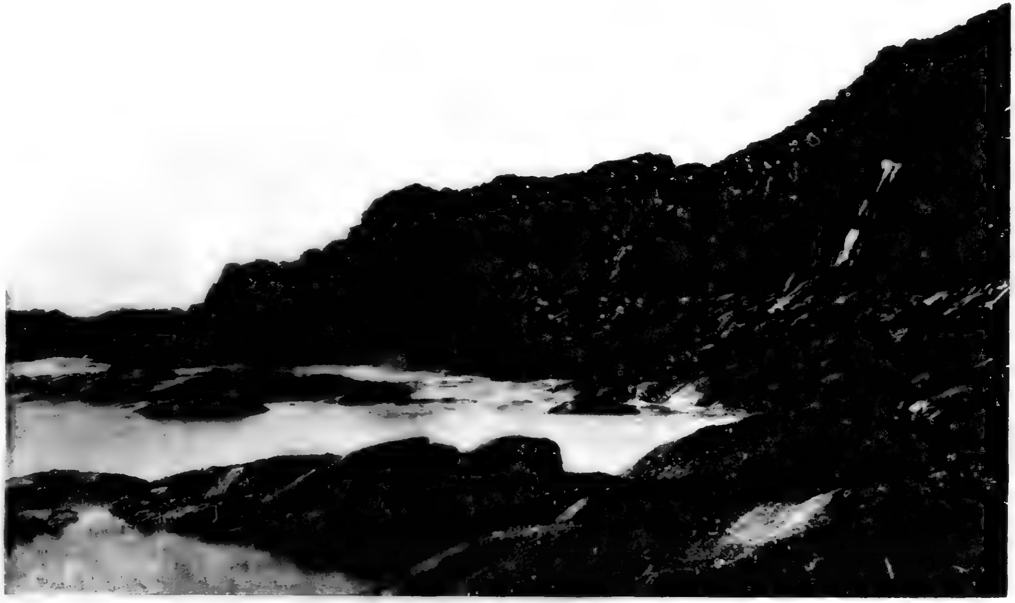
GLINKA COPPER ISLAND DRIVEWAY FROM DOPOLATA TO KILLING GROUNDS AUGUST 21, 1897

PLATE 80.



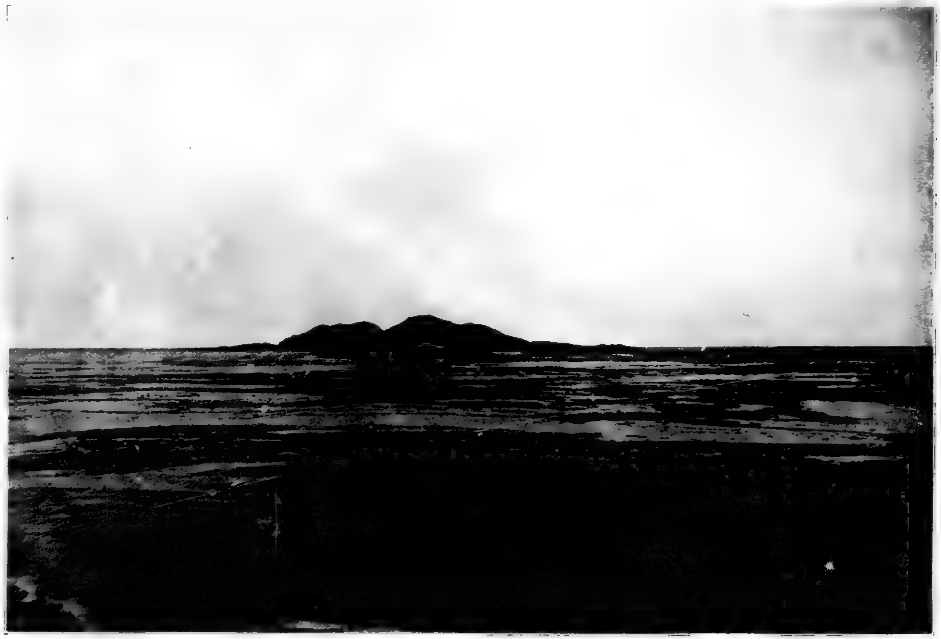
HIGH ROCK, MUSHIR, KURILS. FROM TOP OF LONG ROCK. AUGUST 22, 1896, 2.15 P M

PLATE 81.



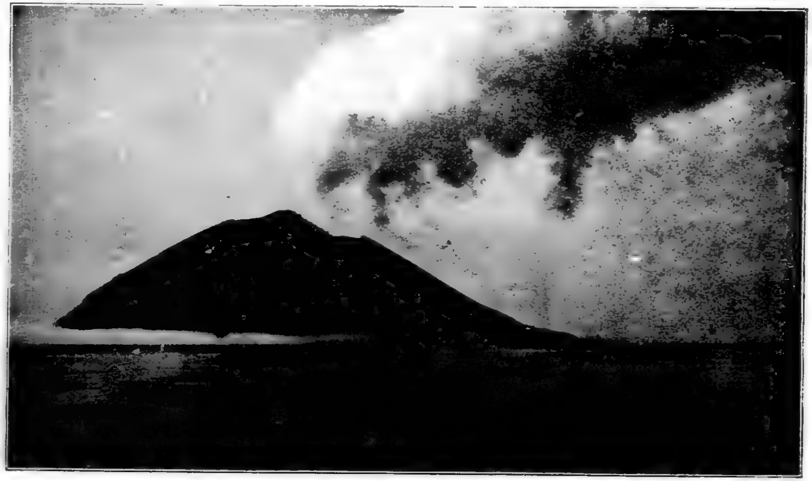
BEACH OF LONG ROCK MUSHIR, KURILS LOOKING WEST. AUGUST 22, 1896, 3.15 P. M.

PLATE 82.



LONG ROCK, MUSHIR, KURILS. FROM NORTHWEST POINT OF HIGH ROCK. AUGUST 22, 1896, 4 P M.

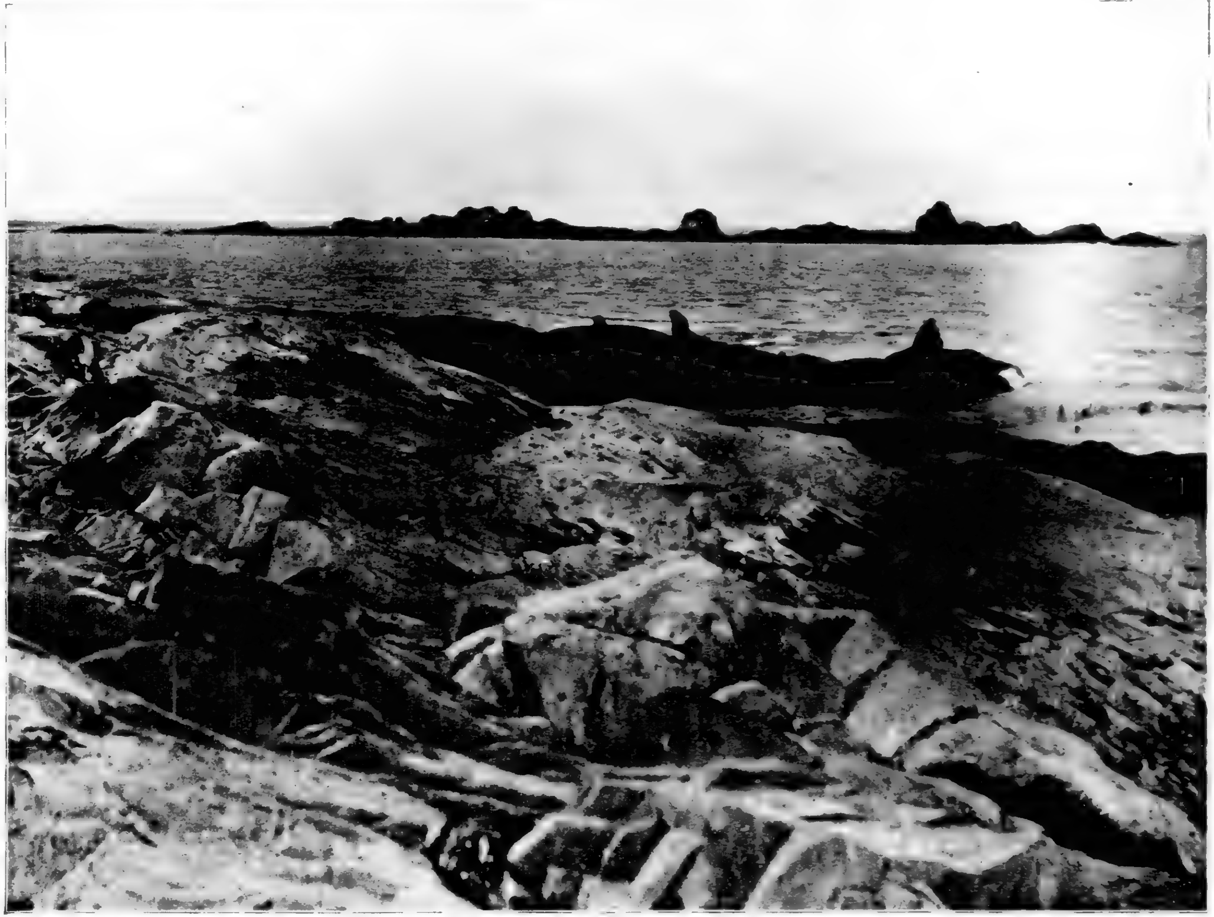
PLATE 83.



RAIKOKE ISLAND, KURILS. EAST SIDE FROM STEAMER'S DECK. AUGUST 23, 1896, 3 P. M. FOG COVERS THE BASE OF THE ISLAND.

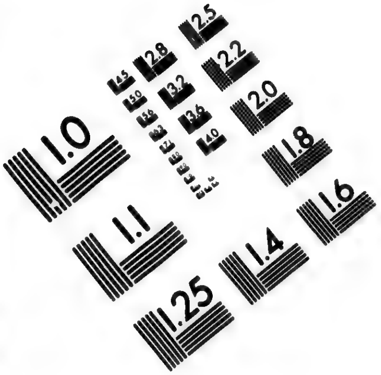
PLATE 84.

PLATE 84.



SREDNOI FLAT ROCK, KURILS WITH SEA LIONS IN THE DISTANCE BLACK ROCK. AUGUST 24 1896 NOON

Photograph by N. B. Miller



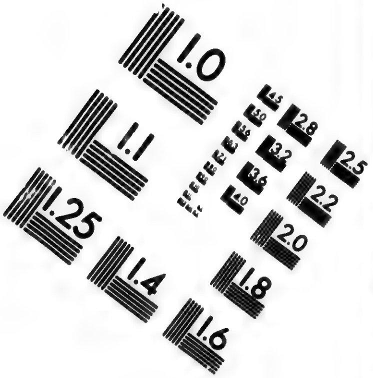
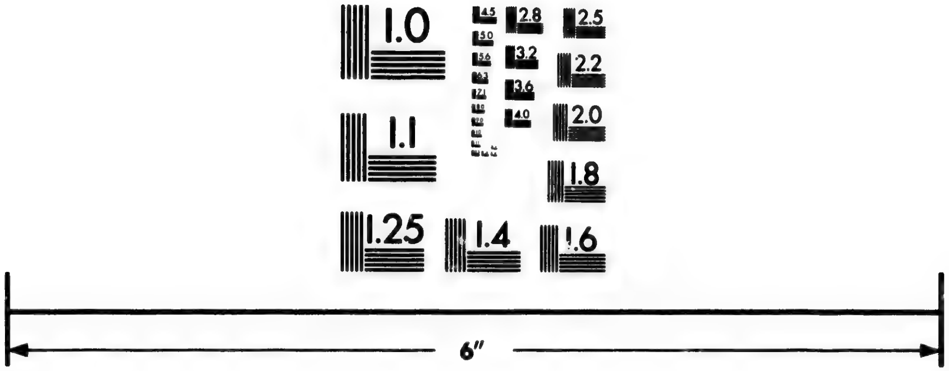
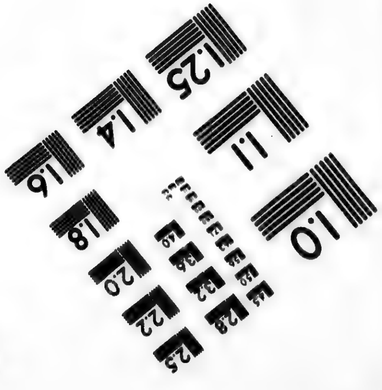


IMAGE EVALUATION TEST TARGET (MT-3)

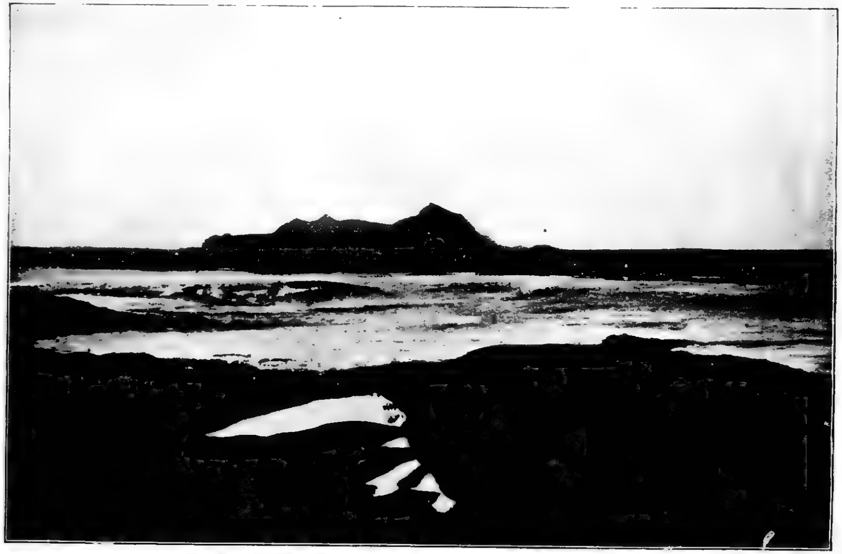




Photographic
Sciences
Corporation

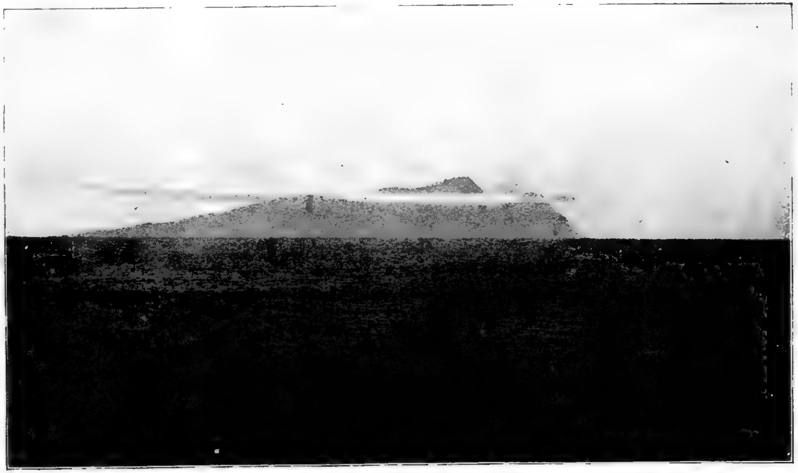
23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503

PLATE 85.

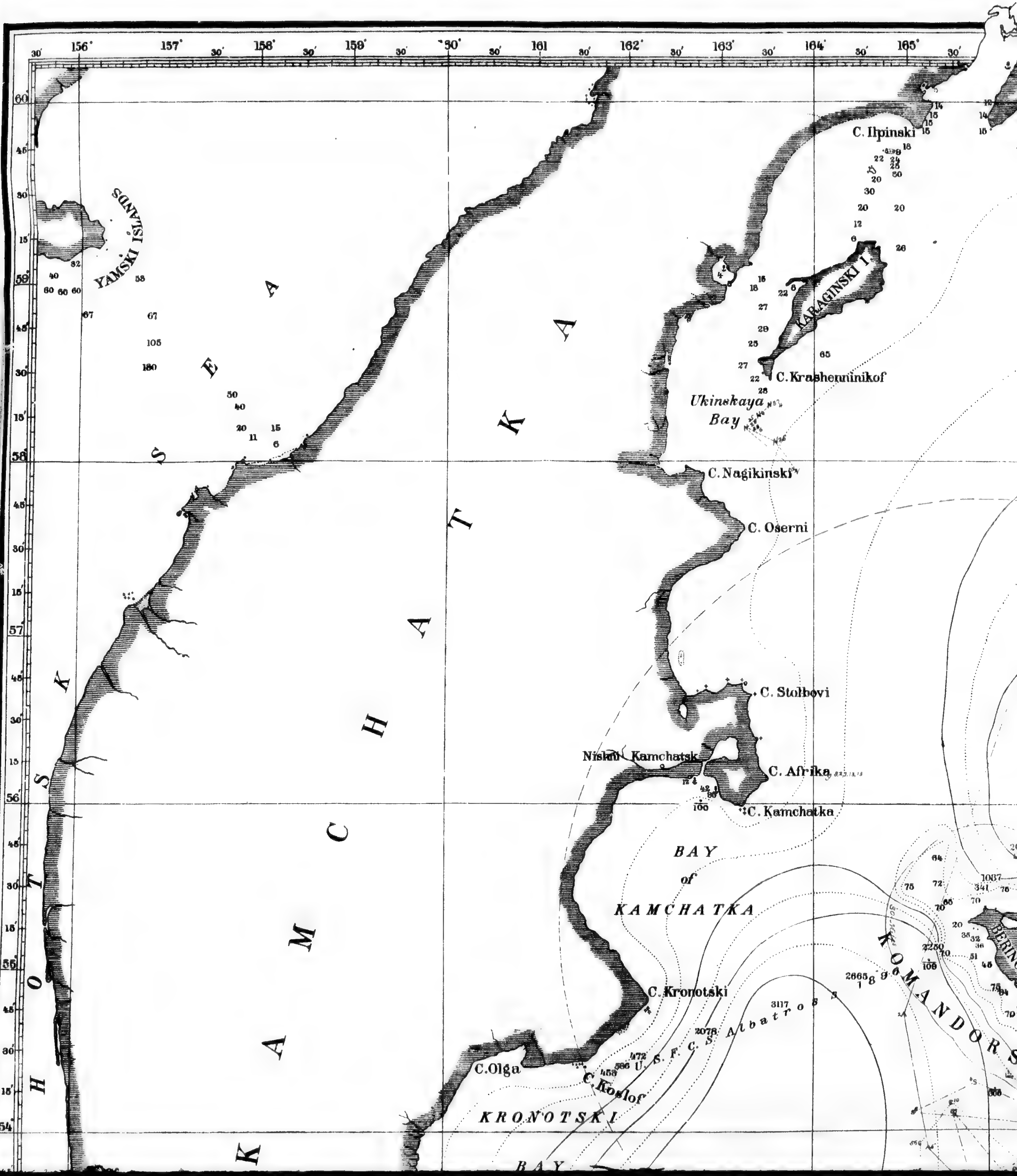


USHISHIR ISLAND, KURILS. FROM SREDNOI FLAT ROCK. AUGUST 24, 1896.

PLATE 86.



KETOI ISLAND, KURILS. ABOUT 13 MILES S. 20° W. FROM STEAMER'S DECK. AUGUST 26, 1896, 9.30 A. M.


156°
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162°
163°
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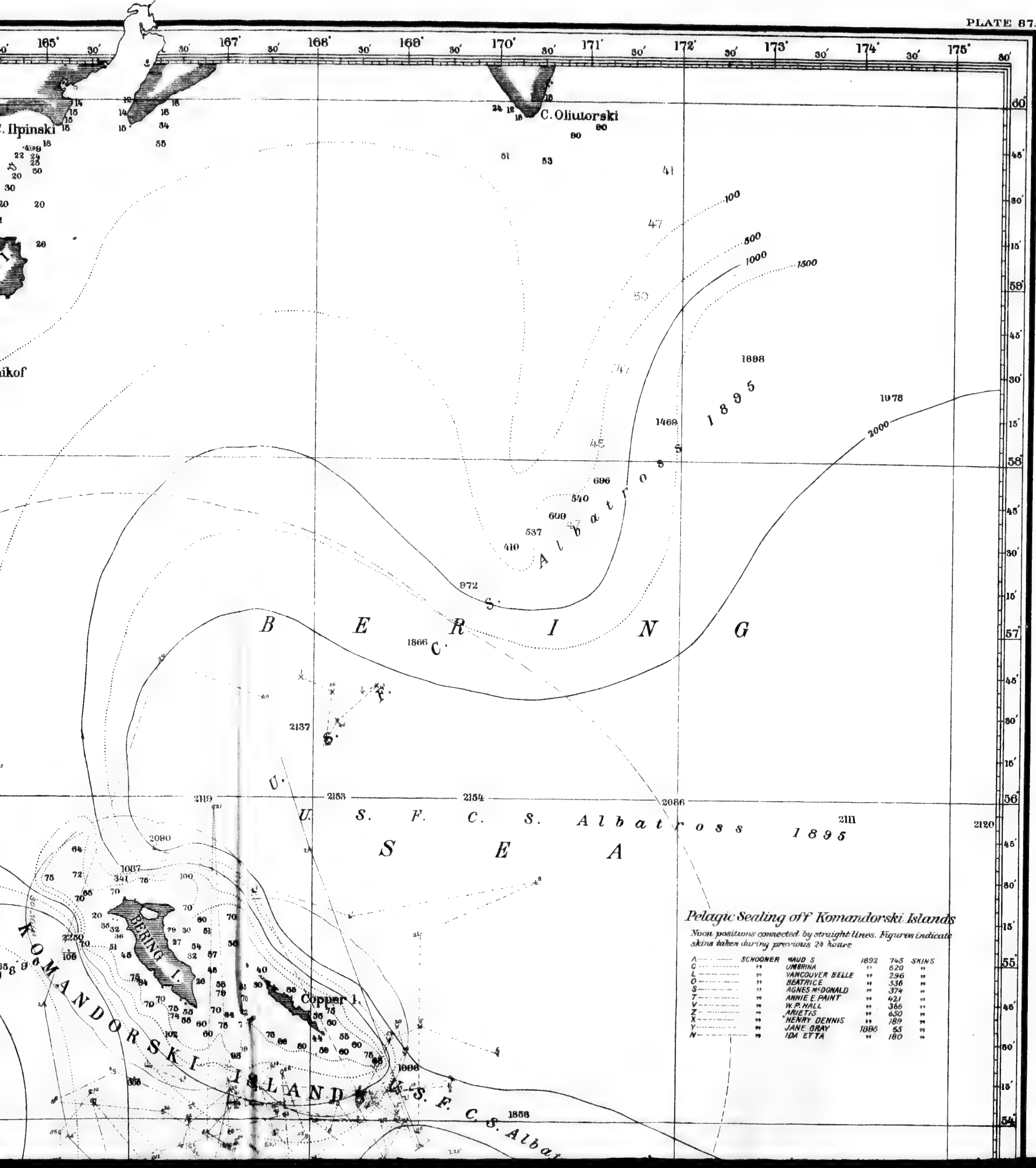
165°
60°
59°
58°
57°
56°
55°
54°
YAMSKI ISLANDS
S E A
K A M C H A T K A
O H O T S K
C. Ilpinski
KARAGINSKI I.
C. Krasheninnikof
Ukinskaya Bay
C. Nagikinski
C. Oserni
C. Stolbovi
Nishni Kamchatsk
C. Afrika
C. Kamchatka
BAY of KAMCHATKA
KOMANDORS
BERING
C. Kronotski
U. S. F. C. S. Albatross
C. Olga
C. Koslof
KRONOTSKI BAY

PLATE 87.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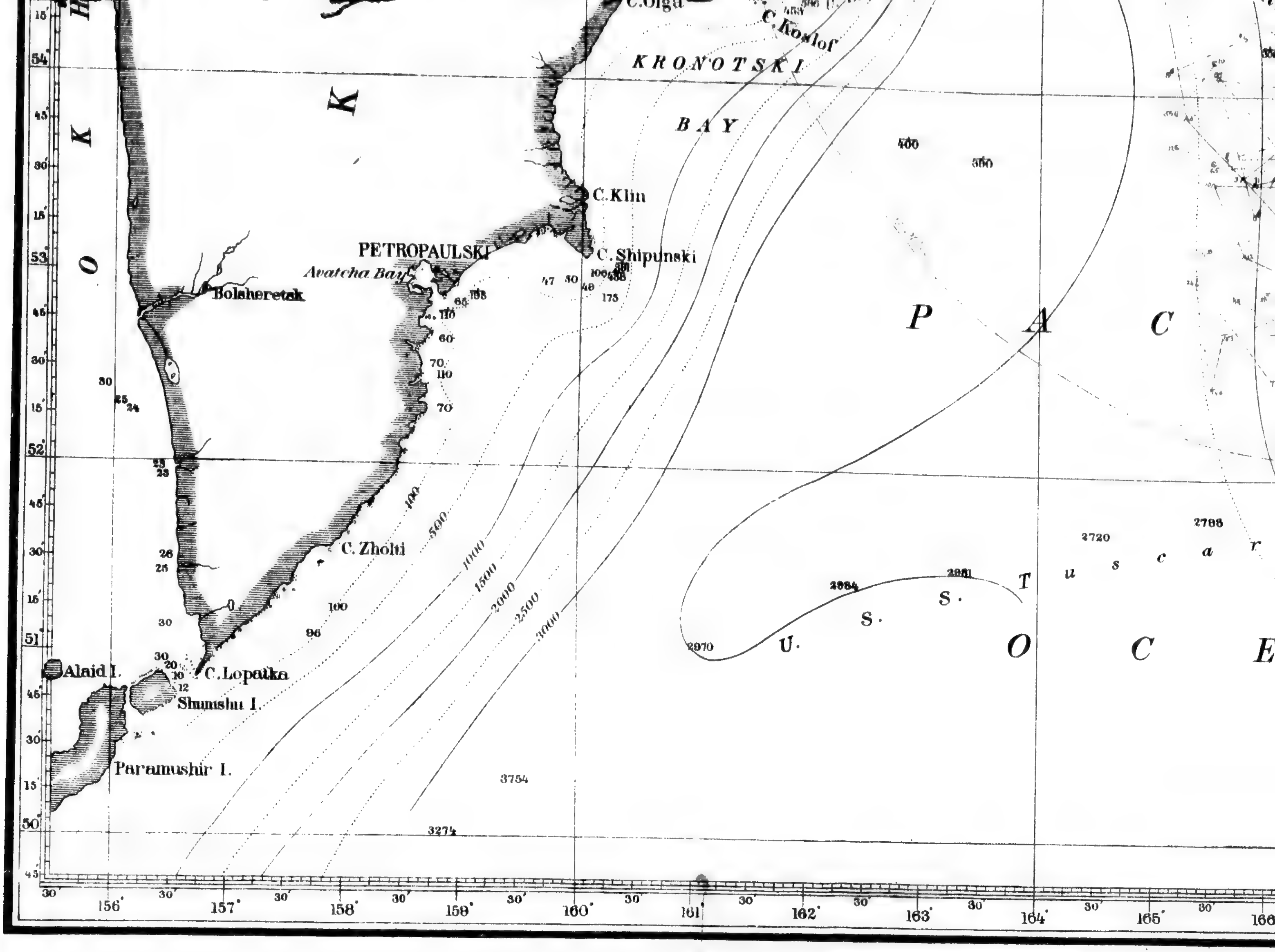
C. Ilpinski
C. Oliutorski
ikof
BERING
SEA
U. S. F. C. S. Albatross 1895
U. S. F. C. S. Albatross 1895
U. S. F. C. S. Albat
KOMANDORSKI ISLANDS
BERING I.
Copper I.
100
500
1000
1500
2000
Pelagic Sealing off Komandorski Islands
Noon positions connected by straight lines. Figures indicate skins taken during previous 24 hours
A — SCHOONER MAUD S 1892 745 SKINS
C — " UMBRINA " 620 "
L — " VANCOUVER BELLE " 296 "
O — " BEATRICE " 536 "
S — " AGNES McDONALD " 374 "
T — " ANNIE E. PAINT " 421 "
V — " W. P. HALL " 366 "
Z — " ARIETIS " 650 "
X — " HENRY DENNIS " 189 "
Y — " JANE GRAY 1895 65 "
N — " IDA ETTA " 180 "


C. Olga
C. Koslof
KRONOTSKI
BAY
C. Klin
C. Shipunski
PETROPAULSKI
Avatcha Bay
Bolsheretsk
C. Zholti
C. Lopatka
Alaid I.
Shumshu I.
Paramushir I.
O
K
K
P A C
O C E
U. S. S. Tuscar
400
360
3720
2788
2984
2981
2970
3754
3274
100
500
1000
1500
2000
2500
3000
156°
157°
158°
159°
160°
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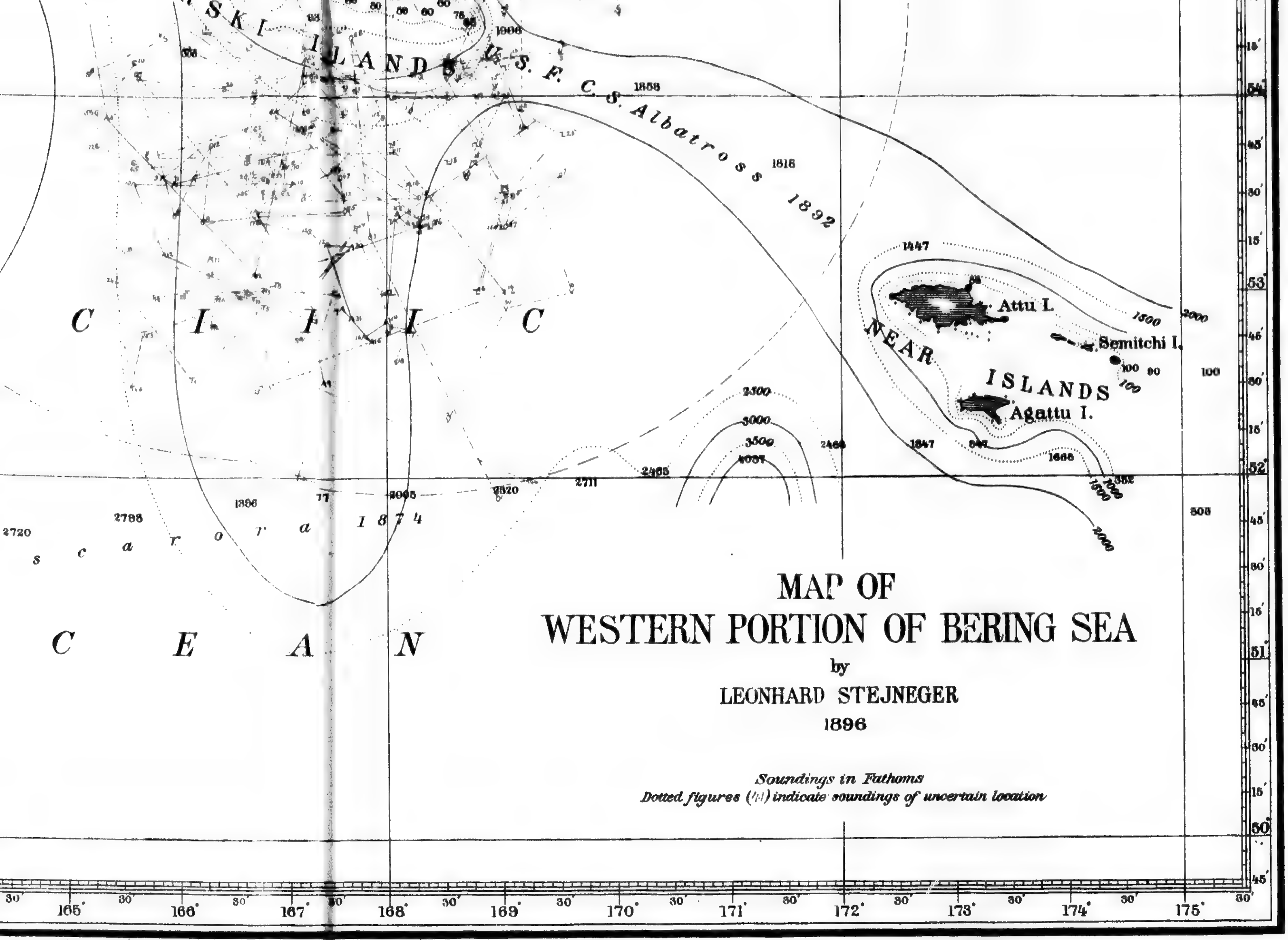
162°
163°
164°
165°
54°
53°
52°
51°
50°



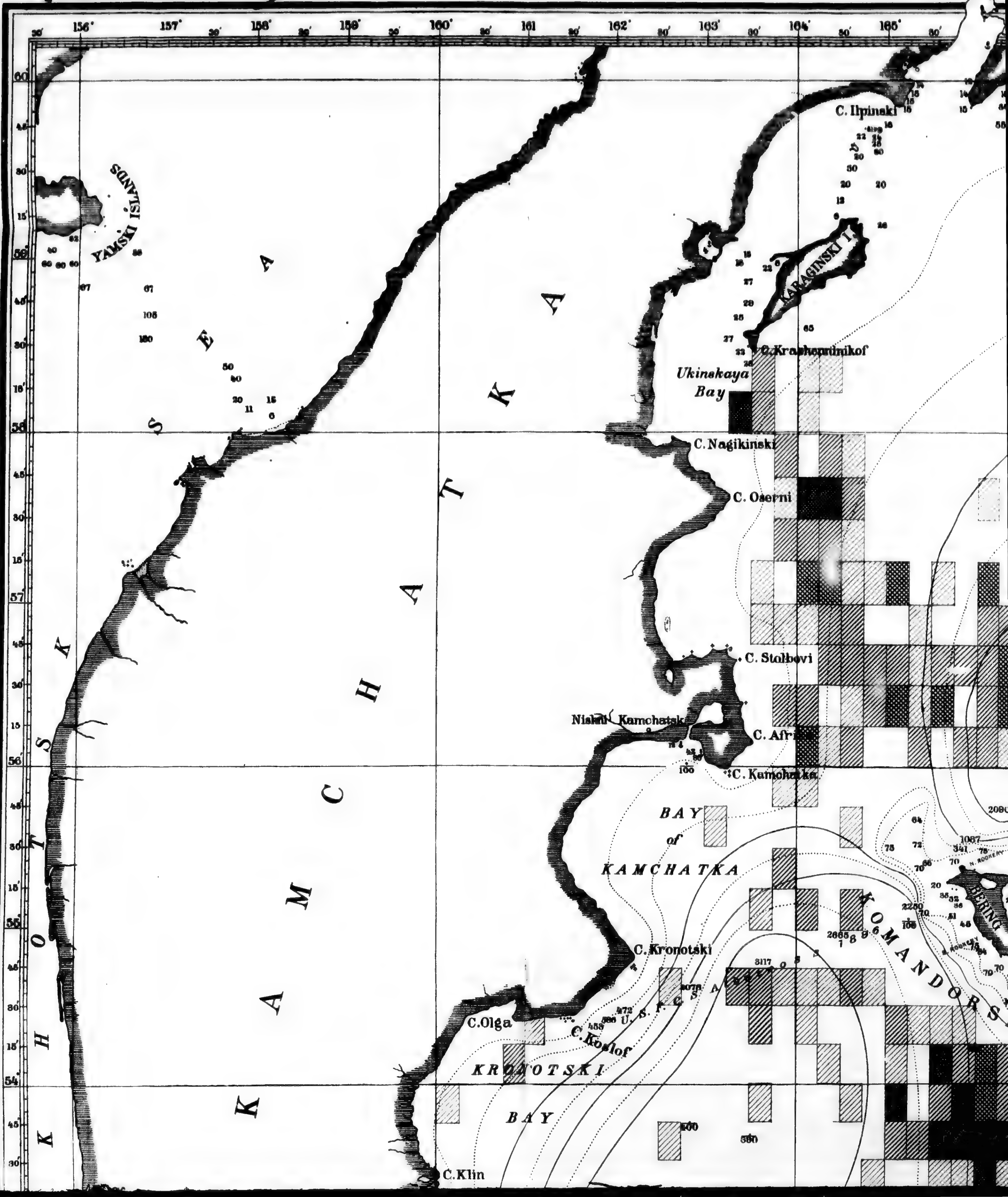
MAP OF
WESTERN PORTION OF BERING SEA

by

LEONHARD STEJNEGER

1896

Soundings in Fathoms
Dotted figures (41) indicate soundings of uncertain location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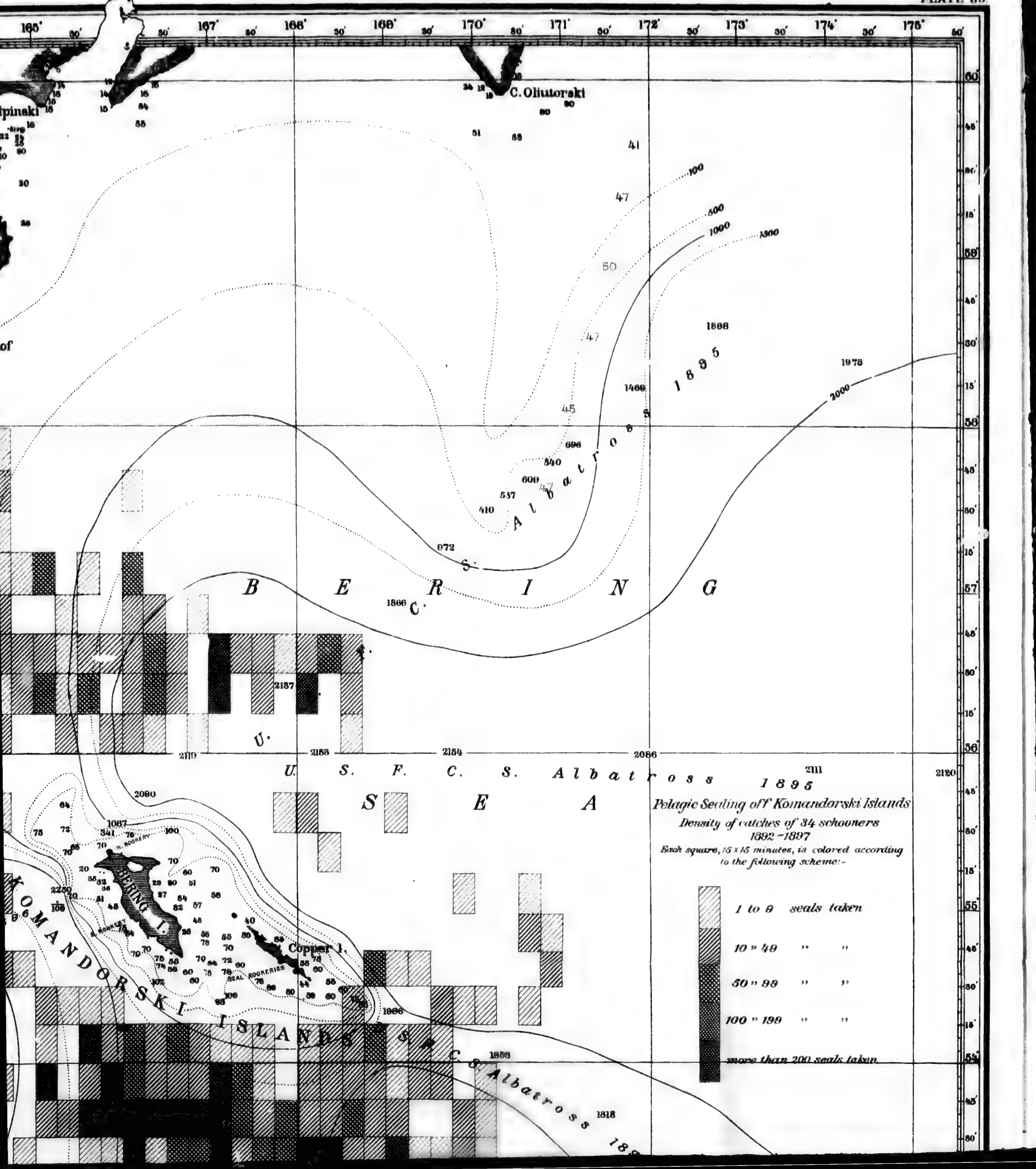
54°
YAMSKI ISLANDS
S E A
O K H O T S K
K A M C H A T K A
K A M C H A T K A
C. Ilpinski
KARAGINSKI I.
C. Krasheninnikof
Ukinskaya Bay
C. Nagikinski
C. Oserni
C. Stolbovi
Nishni Kamchatsk
C. Africa
C. Kamchatka
BAY of KAMCHATKA
C. Kronotski
C. Olga
C. Koslof
KRONOTSKI BAY
C. Klin
U. S. F. C. S. ALBATROSS
KOMANDORSKI
BERING
N. ROOKERY
S. ROOKERY
2090
1067
2250
2665
3117
3078
472
455
400
380

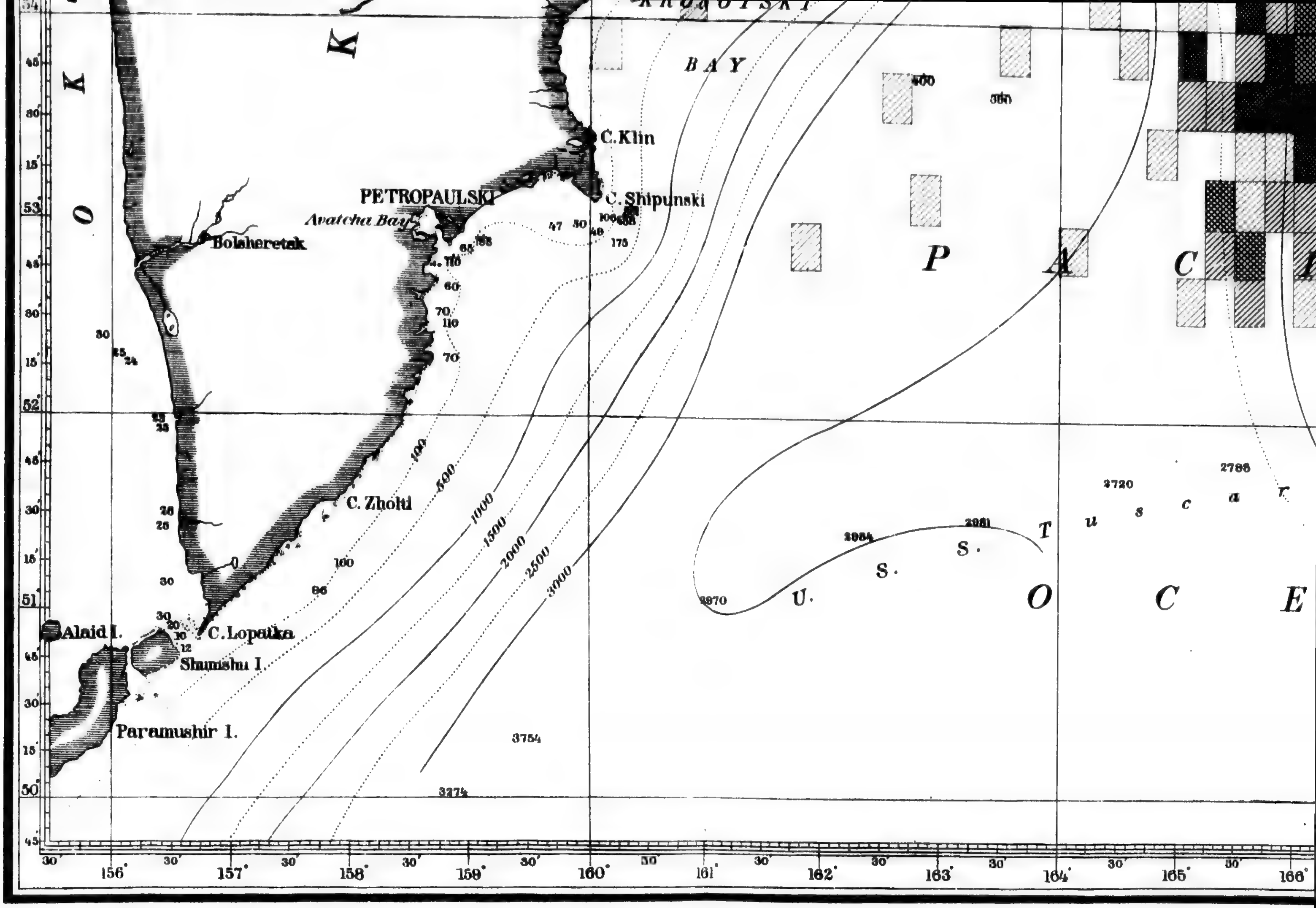


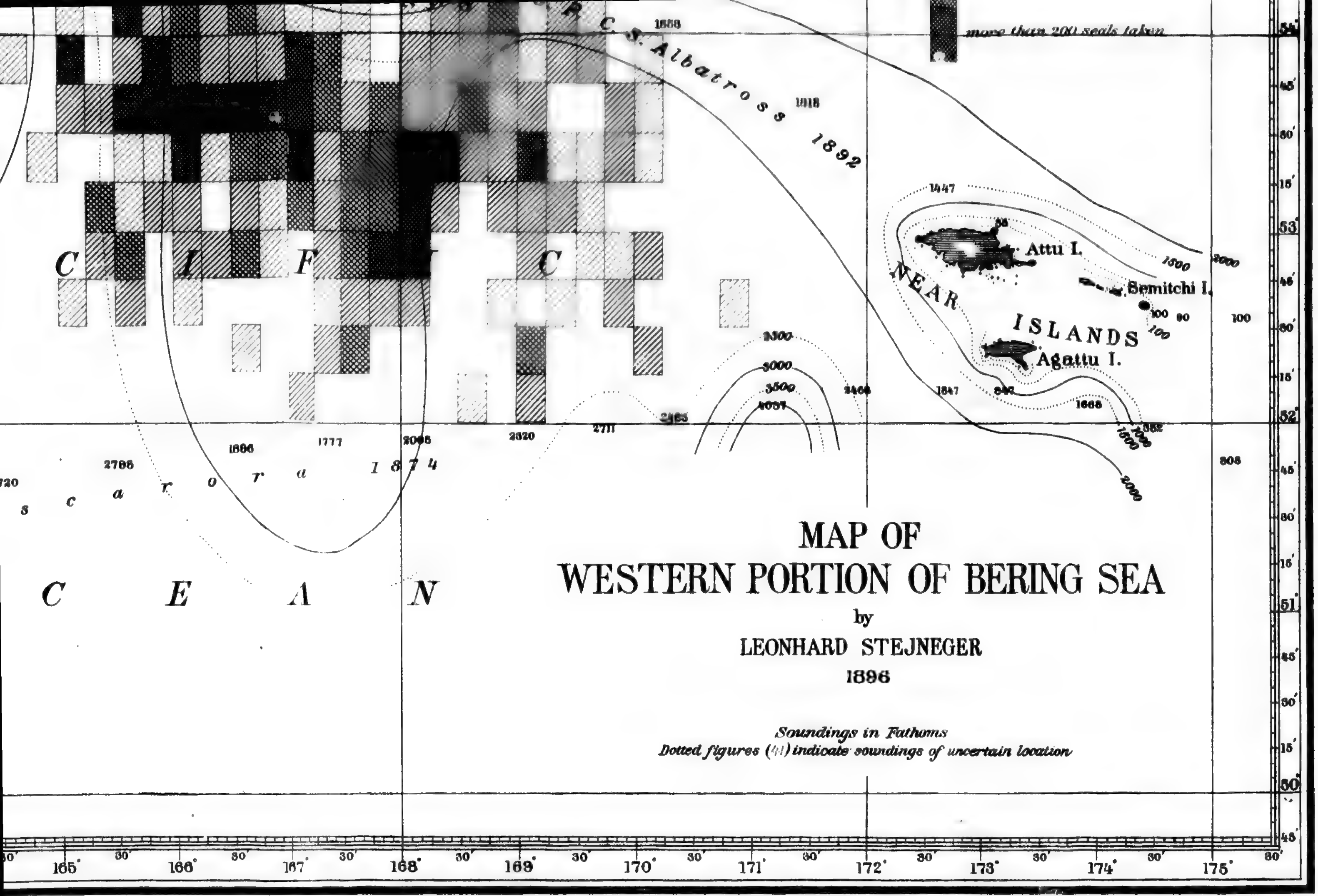
Pelagic Sealing off Komandorski Islands

Density of catches of 34 schooners
1892–1897

Each square, 15 × 15 minutes, is colored according to the following scheme:–

▨	*1 to 9 seals taken*
▨	*10 " 49 " "*
▨	*50 " 99 " "*
▨	*100 " 199 " "*
■	*more than 200 seals taken*


K
O
K
BAY
C. Klin
PETROPAULSKI
Avatcha Bay
C. Shipunski
Bolsheretsk
P A C
C. Zholti
Alaid I.
C. Lopatka
Shumshu I.
Paramushir I.
U. S. S. Tuscar
O C E
100
500
1000
1500
2000
2500
3000
3754
3274
2870
2954
2981
3720
2788
400
500
156°
157°
158°
159°
160°
161°
162°
163°
164°
165°
166°
53
52
51
50



MAP OF
WESTERN PORTION OF BERING SEA
by
LEONHARD STEJNEGER
1896

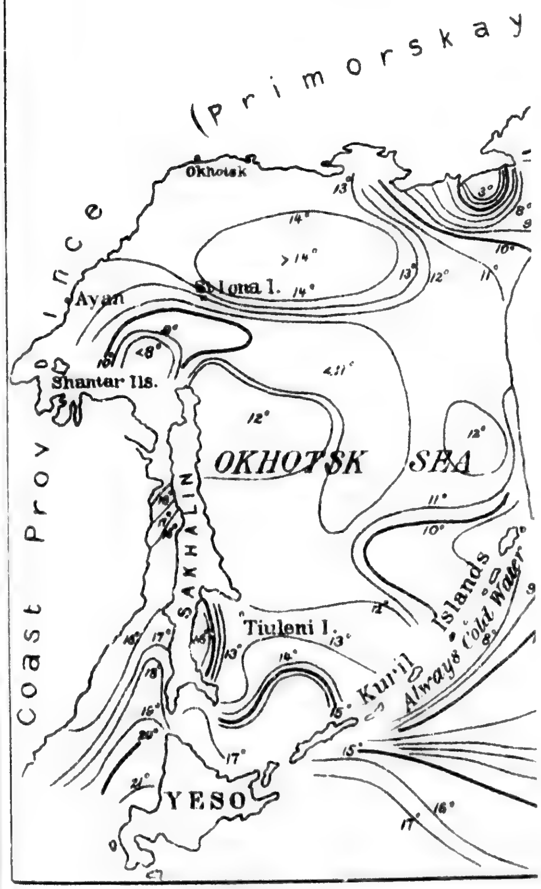
Soundings in Fathoms
Dotted figures (41) indicate soundings of uncertain location

Isotherms of the Surf

for August

From Makarof "Vitiaz i "

Degrees Celsius Th



Isotherms of the Surface of the Sea

for August 16

From Makarof "Vitiaz i Tikhi Okean" pl.V

Degrees Celsius Thermometer

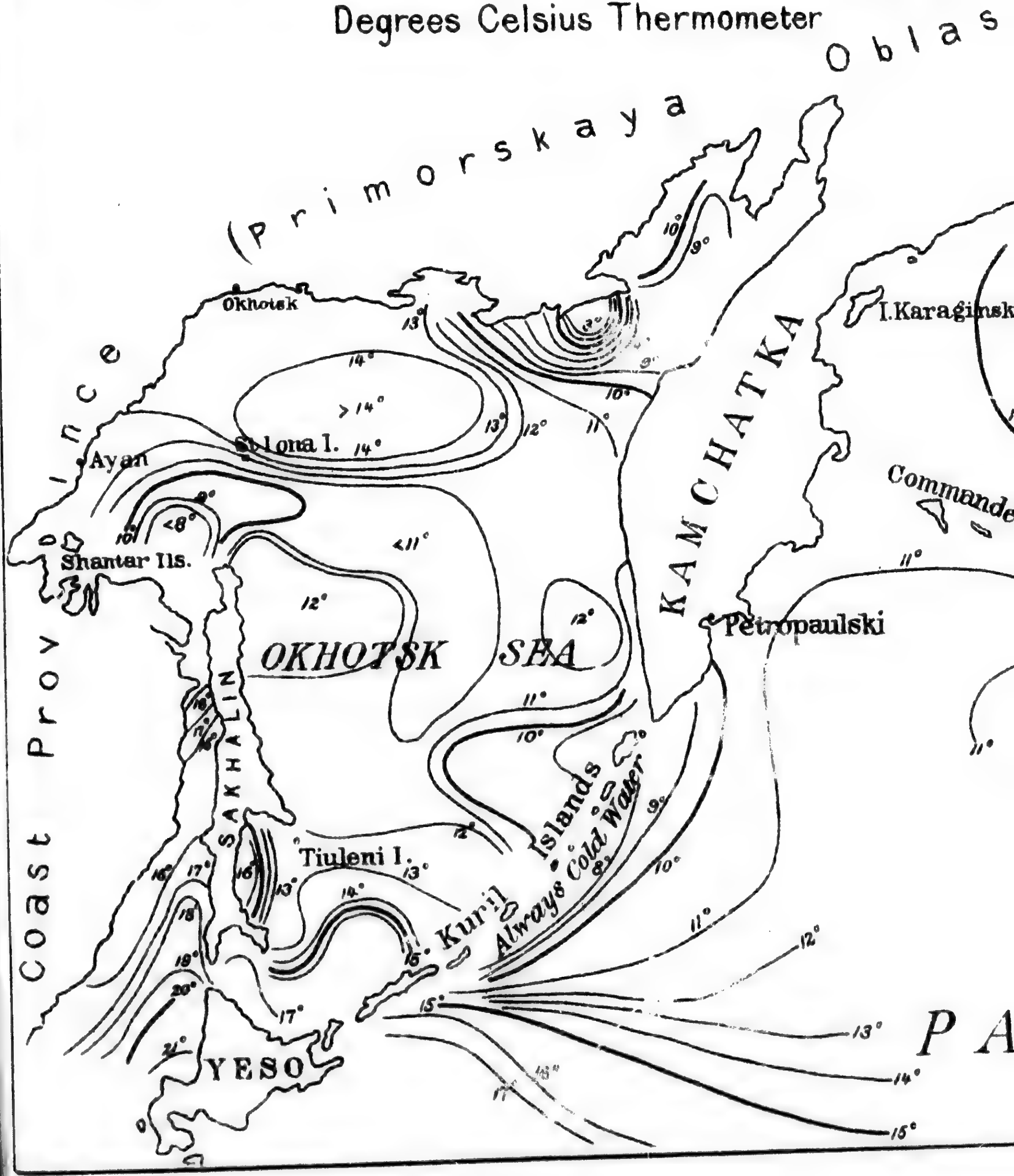
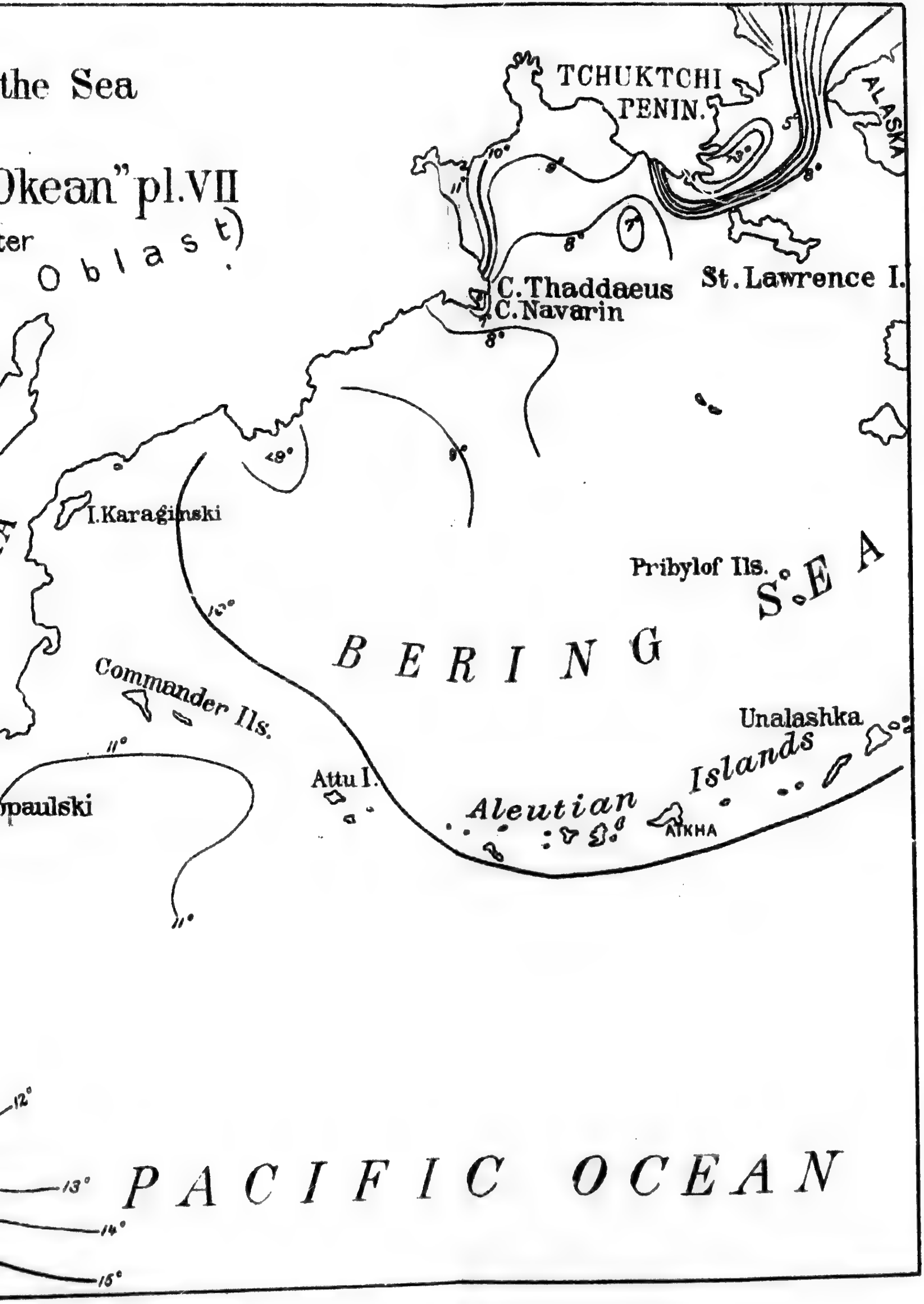


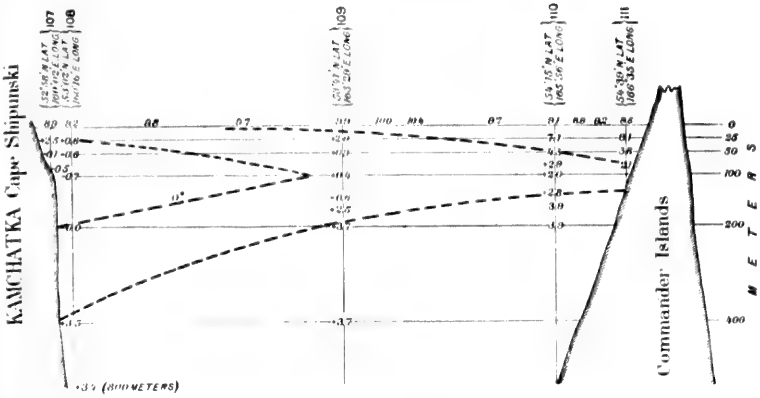
PLATE 89.



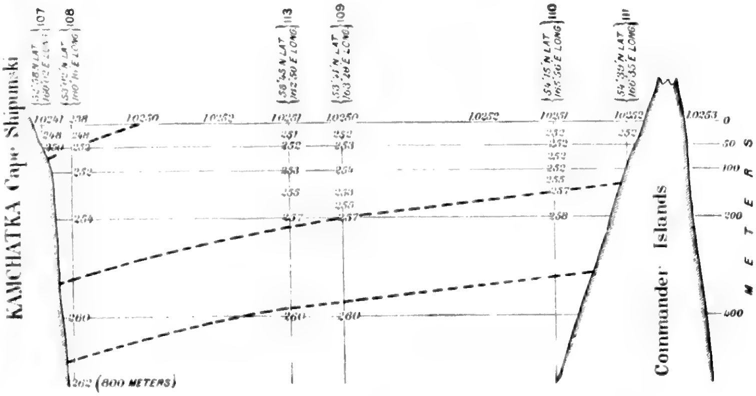
the Sea
kean" pl.VII
ter
Oblast)
TCHUKTCHI
PENIN.
ALASKA
10°
11°
9°
8°
7°
5°
3°
8°
C.Thaddaeus
C.Navarin
St. Lawrence I.
8°
<8°
9°
I.Karaginski
12°
Pribylof Ils.
BERING SEA
Commander Ils.
11°
paulski
Attu I.
Aleutian Islands
ATKHA
Unalashka
11°
12°
13°
14°
15°
PACIFIC OCEAN

KAMCHATKA Cape Shipunski
107
108
KAMCHATKA Cape Shipunski
107
108
TEMPERA
"Vitiaz"

TEMPERATURES



SPECIFIC GRAVITY

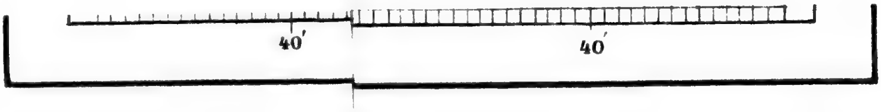


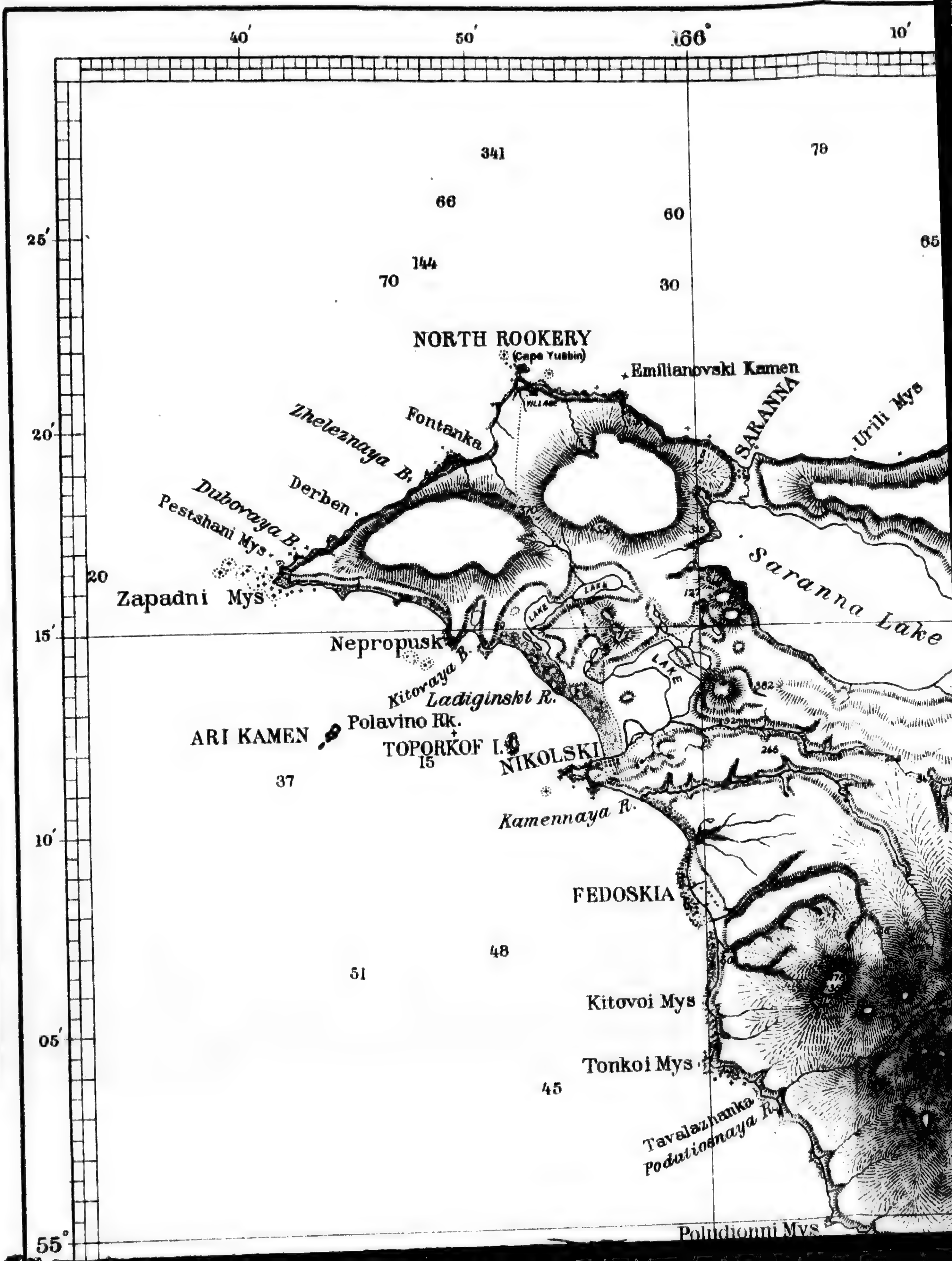
TEMPERATURES AND SPECIFIC GRAVITY OF THE WATER IN BERING SEA BETWEEN KAMCHATKA AND THE COMMANDER ISLANDS, JULY 29 TO AUGUST 2, 1888

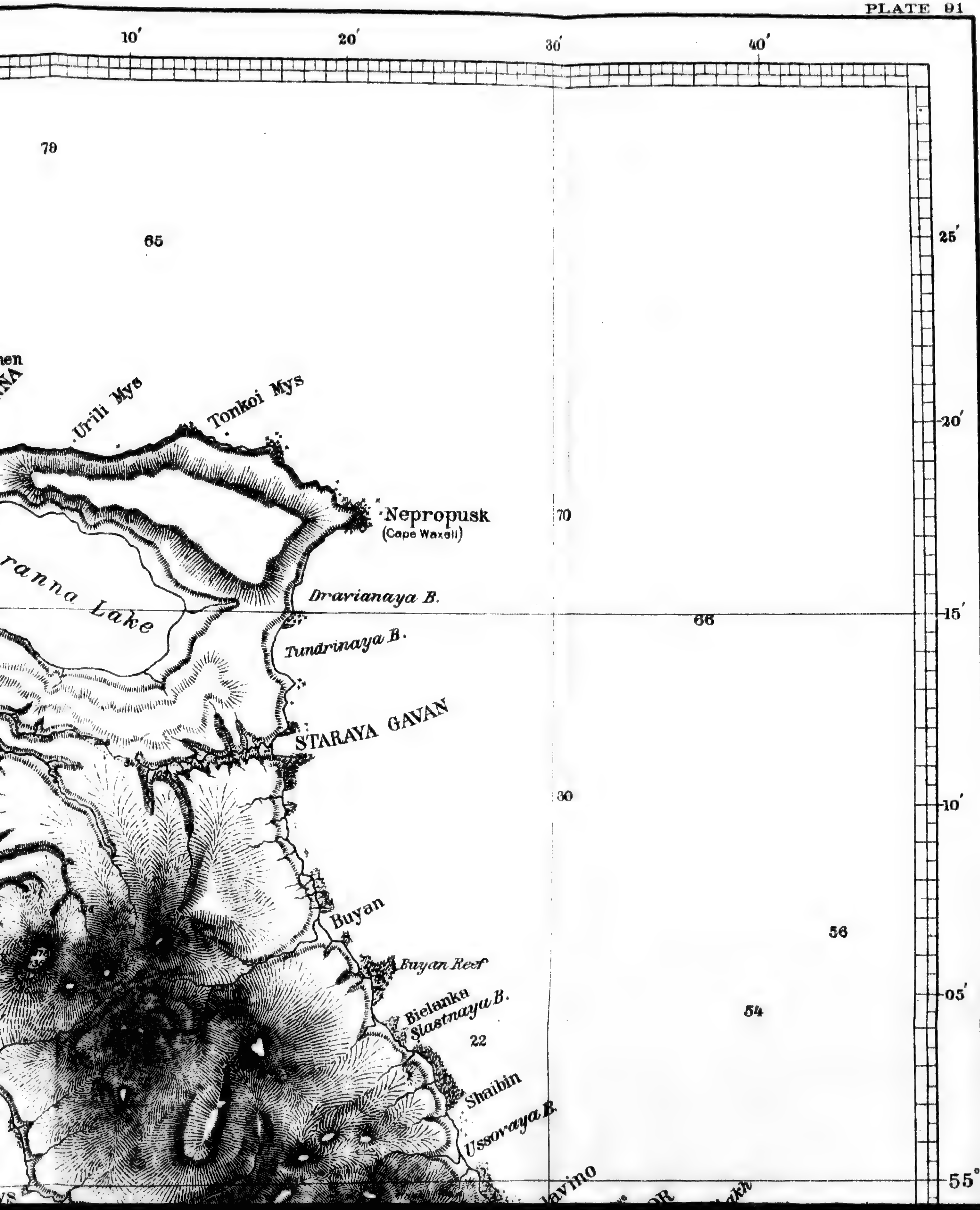
(From Makarof's "Vitiaz i Tikhi Okean," Pl. VIII, by permission of the author.)

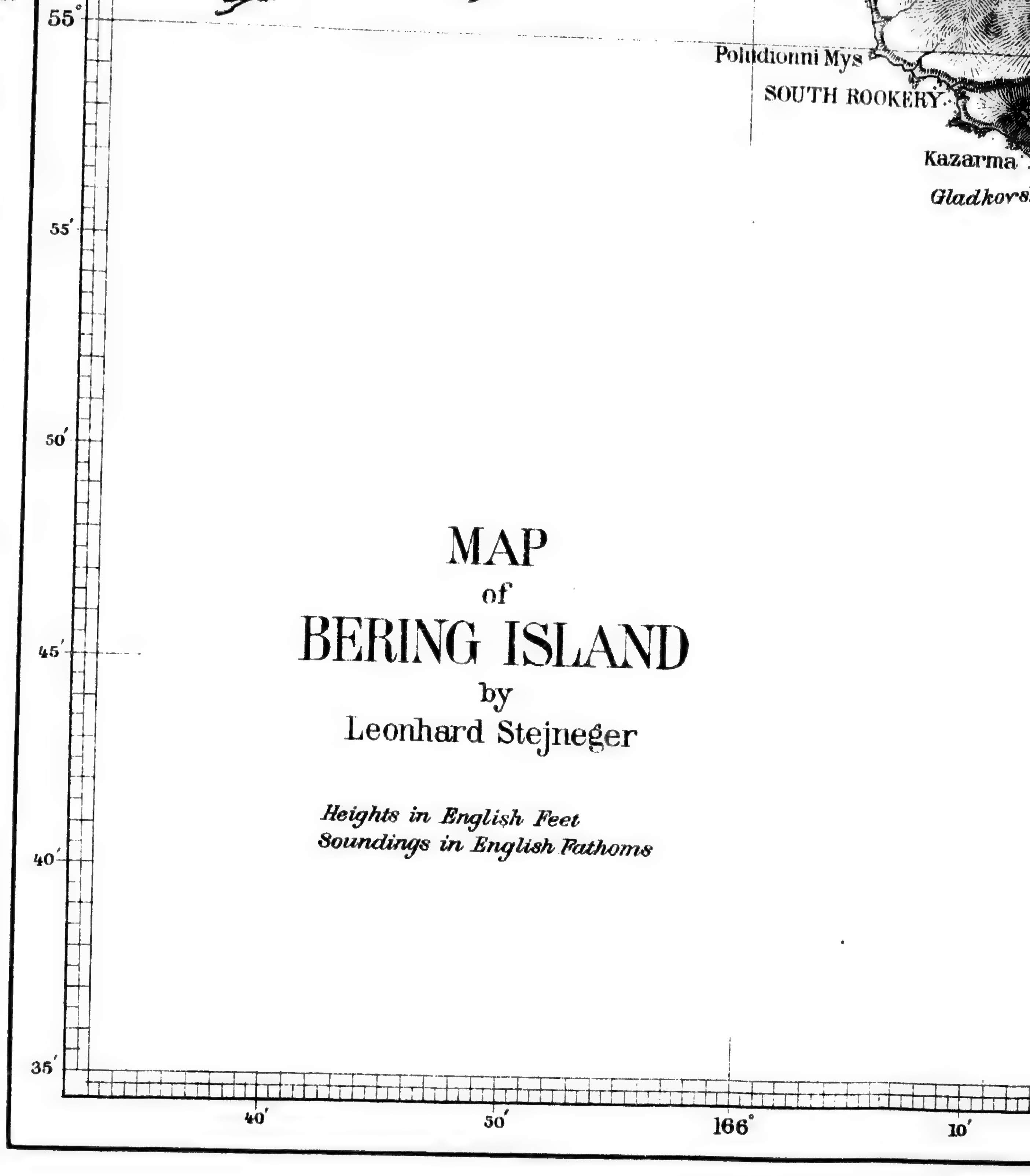
"Vitiaz" **Station No. 107,** July 29, 4 p. m.; **108,** July 29, 6.40 p. m.; **109,** July 30, 9 a. m.; **110,** July 30, 8.15 p. m.; **111,** July 31, 8.37 p. m.; **113,** August 2, 4 30 p. m.

Temperatures in centigrades; depths in meters.


40'
40'

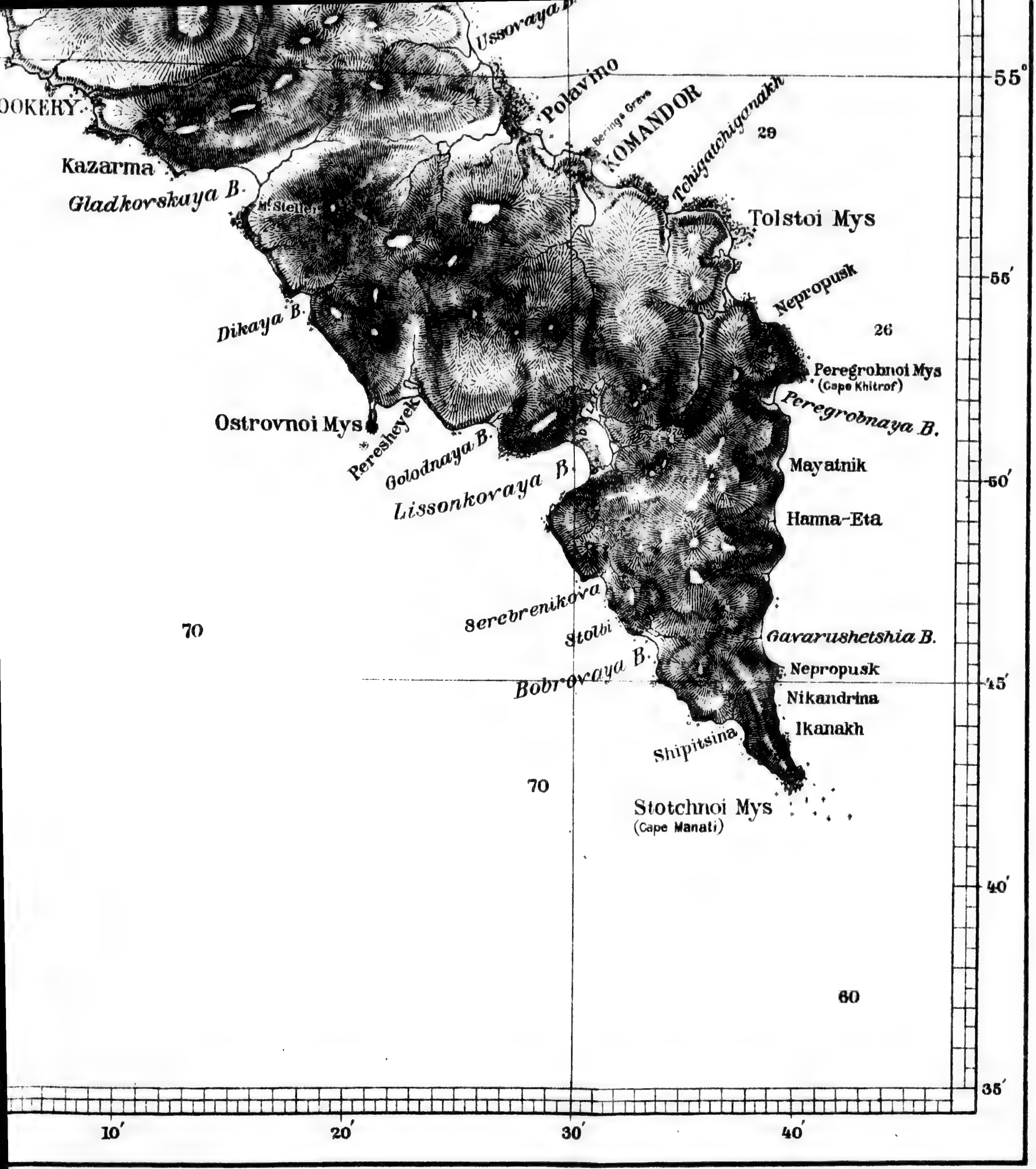

40′
50′
166°
10′
25′
20′
15′
10′
05′
55°
341
79
66
60
65
144
70
30
NORTH ROOKERY
(Cape Yushin)
Emilianovski Kamen
VILLAGE
Zheleznaya B.
Fontanka
SARANNA
Urili Mys
Derben
Dubovaya B.
Pestshani Mys
370
20
Zapadni Mys
Saranna Lake
LAKE
LAKE
LAKE
LAKE
Nepropusk
Kitovaya B.
Ladiginski R.
362
ARI KAMEN
Polavino Rk.
TOPORKOF I.
NIKOLSKI
15
37
Kamennaya R.
FEDOSKIA
48
51
Kitovoi Mys
Tonkoi Mys
45
Tavalazhanka
Podutiosnaya R.
Poludionni Mys


10′
20′
30′
40′
79
65
Urili Mys
Tonkoi Mys
Nepropusk
(Cape Waxell)
70
ranna Lake
Dravianaya B.
Tundrinaya B.
66
STARAYA GAVAN
30
Buyan
56
Buyan Reef
Bielanka
Slastnaya B.
54
22
Shaibin
Ussovaya B.
avino
25′
20′
15′
10′
05′
55°

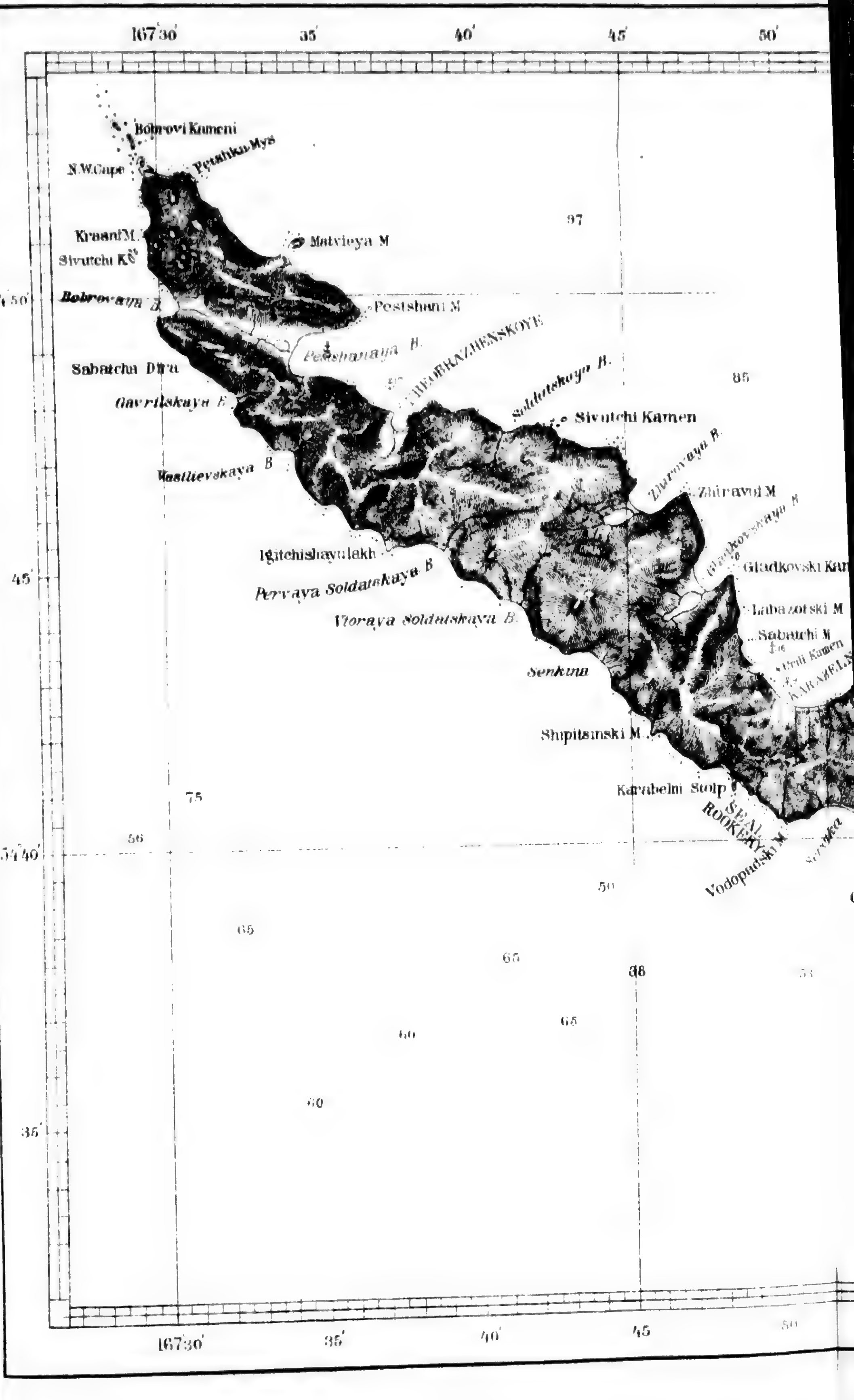


MAP
of
BERING ISLAND
by
Leonhard Stejneger

Heights in English Feet
Soundings in English Fathoms

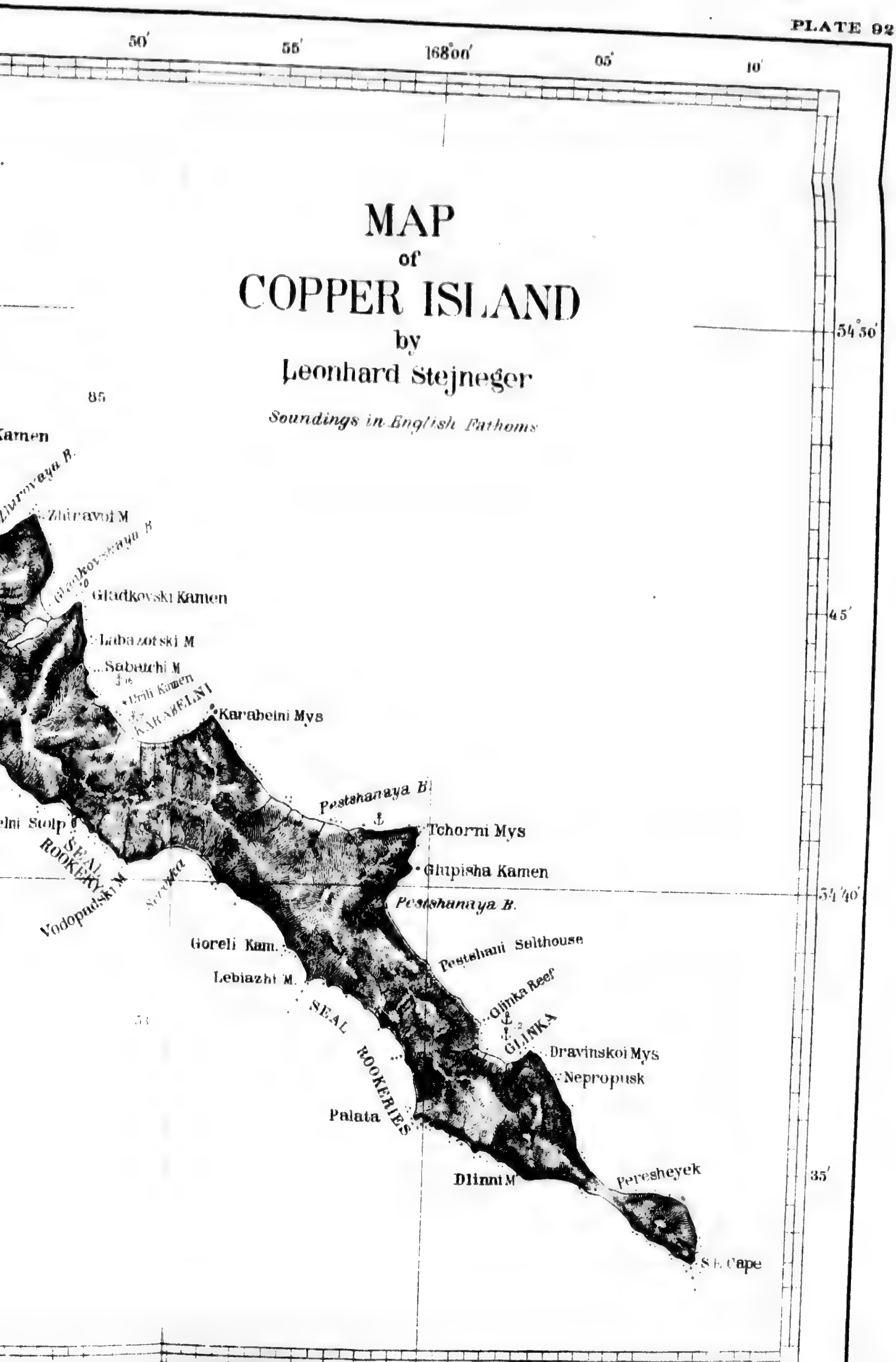

Ussovaya B.
OOKERY
Polavino
Berings Grave
KOMANDOR
Tchigatchiganakh
29
55°
Kazarma
Gladkovskaya B.
Mt. Steller
Tolstoi Mys
55′
Nepropusk
26
Dikaya B.
Peregrobnoi Mys
(Cape Khitrof)
Peregrobnaya B.
Ostrovnoi Mys
Peresheyek
Golodnaya B.
Lissonkovaya B.
Mayatnik
50′
Hanna-Eta
Serebrenikova
70
Stolbi
Gavarushetshia B.
Bobrovaya B.
Nepropusk
45′
Nikandrina
Ikanakh
Shipitsina
70
Stotchnoi Mys
(Cape Manati)
40′
60
35′
10′
20′
30′
40′

5

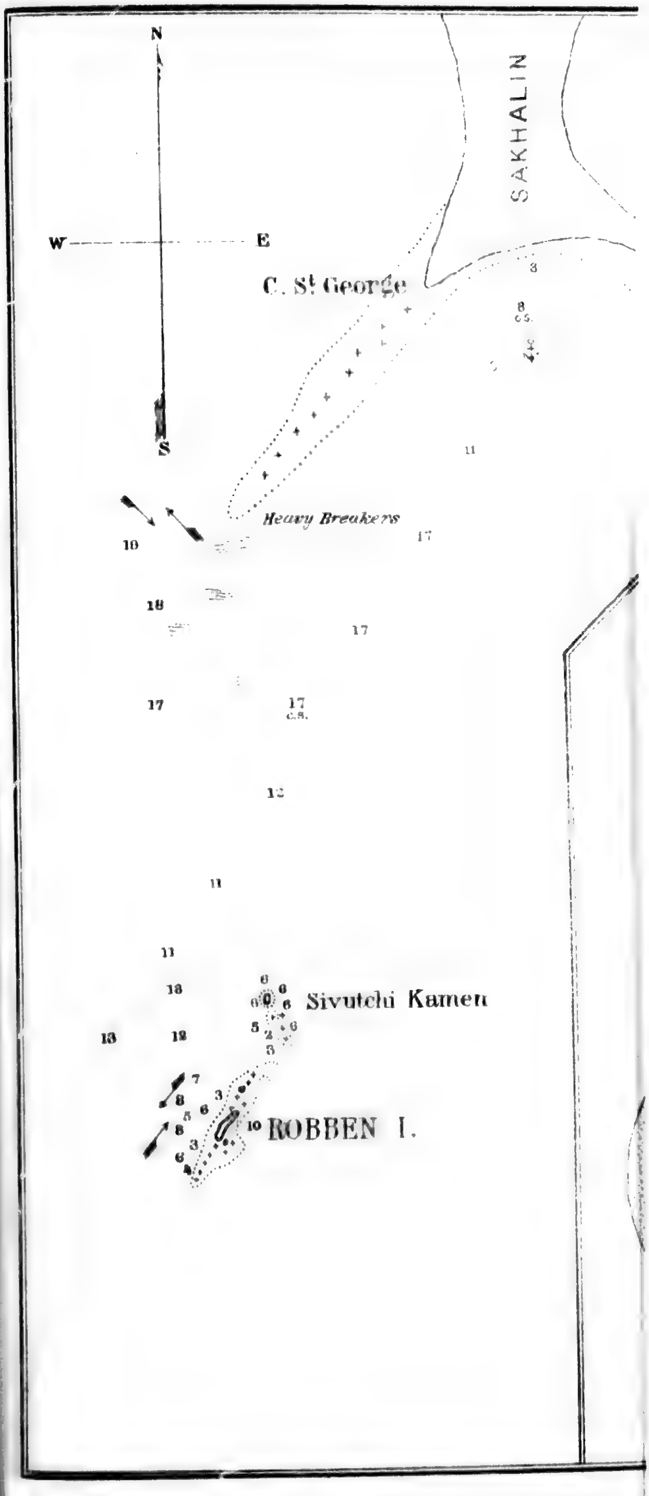

167°30'
35'
40'
45'
50'
Bobrovi Kameni
N.W.Cape
Petshkov Mys
Krasni M.
Sivutchi K.
Matvieya M
97
54°50'
Bobrovaya B.
Pestshani M
Pestshanaya B.
PREOBRAZHENSKOYE
Soldatskaya B.
85
Sabatcha Dira
Gavrilskaya B.
Sivutchi Kamen
Zhiravaya B.
Vasilievskaya B
Zhiravoi M
Gladkovskaya B
Igitchishayulakh
Gladkovski Kam
45'
Pervaya Soldatskaya B
Labazotski M
Vtoraya Soldatskaya B.
Sabatchi M
Urili Kamen
Senkina
KARABELN
Shipitsinski M.
Karabelni Stolp
SEAL ROOKERY
75
56
54°40'
Vodopadski M.
Sarinka
50
65
65
38
53
65
60
60
35'
167°30'
35'
40'
45
50

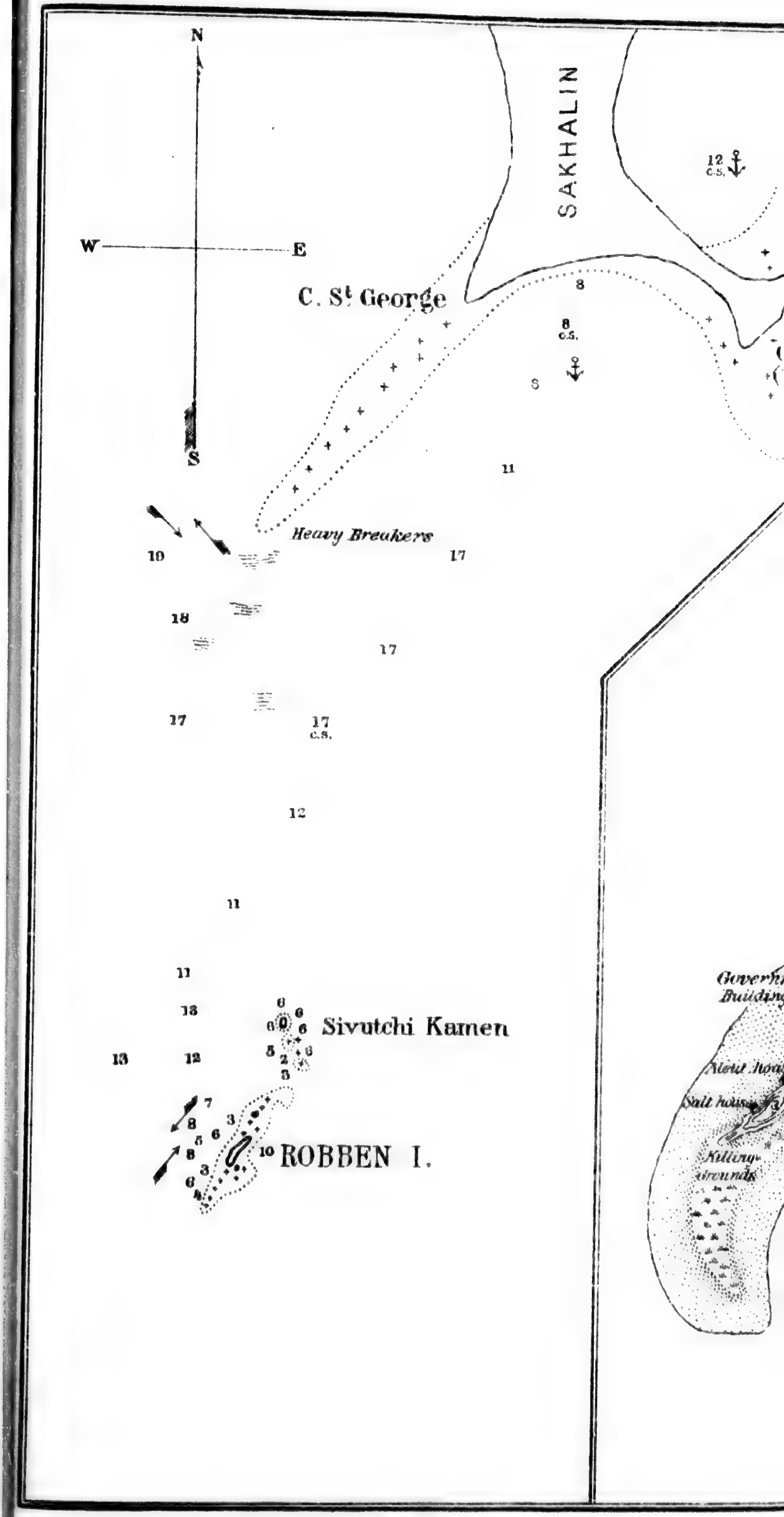
MAP
of
COPPER ISLAND
by
Leonhard Stejneger

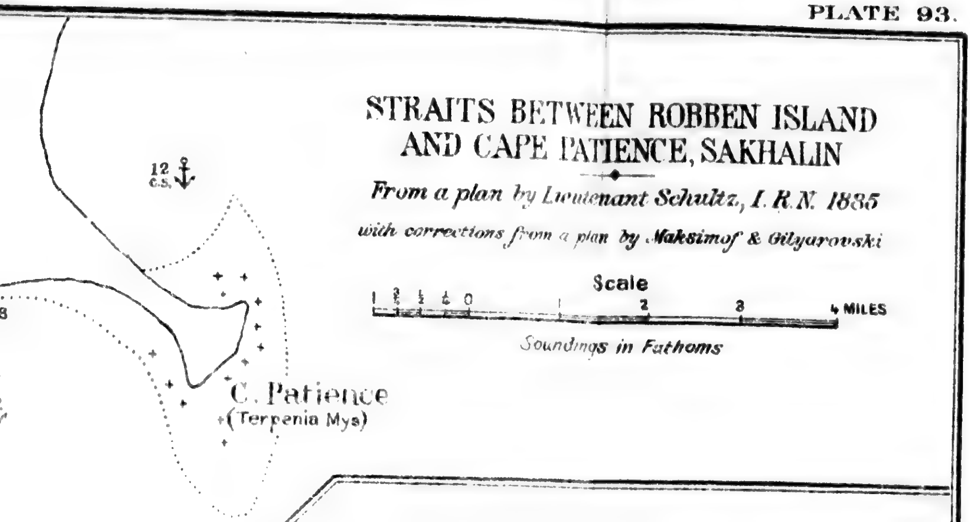
Soundings in English Fathoms



W


N
W
E
S
SAKHALIN
C. St George
3
8 c.s.
4
11
Heavy Breakers
17
10
18
17
17
17 c.s.
12
11
11
13
13
12
6
6
6
5
2
6
3
Sivutchi Kamen
7
8
3
6
5
8
3
6
10
ROBBEN I.


N
W
E
S
SAKHALIN
C. St George
Heavy Breakers
Sivutchi Kamen
ROBBEN I.
Governi
Building
Aleut hou
Salt house
Killing
grounds



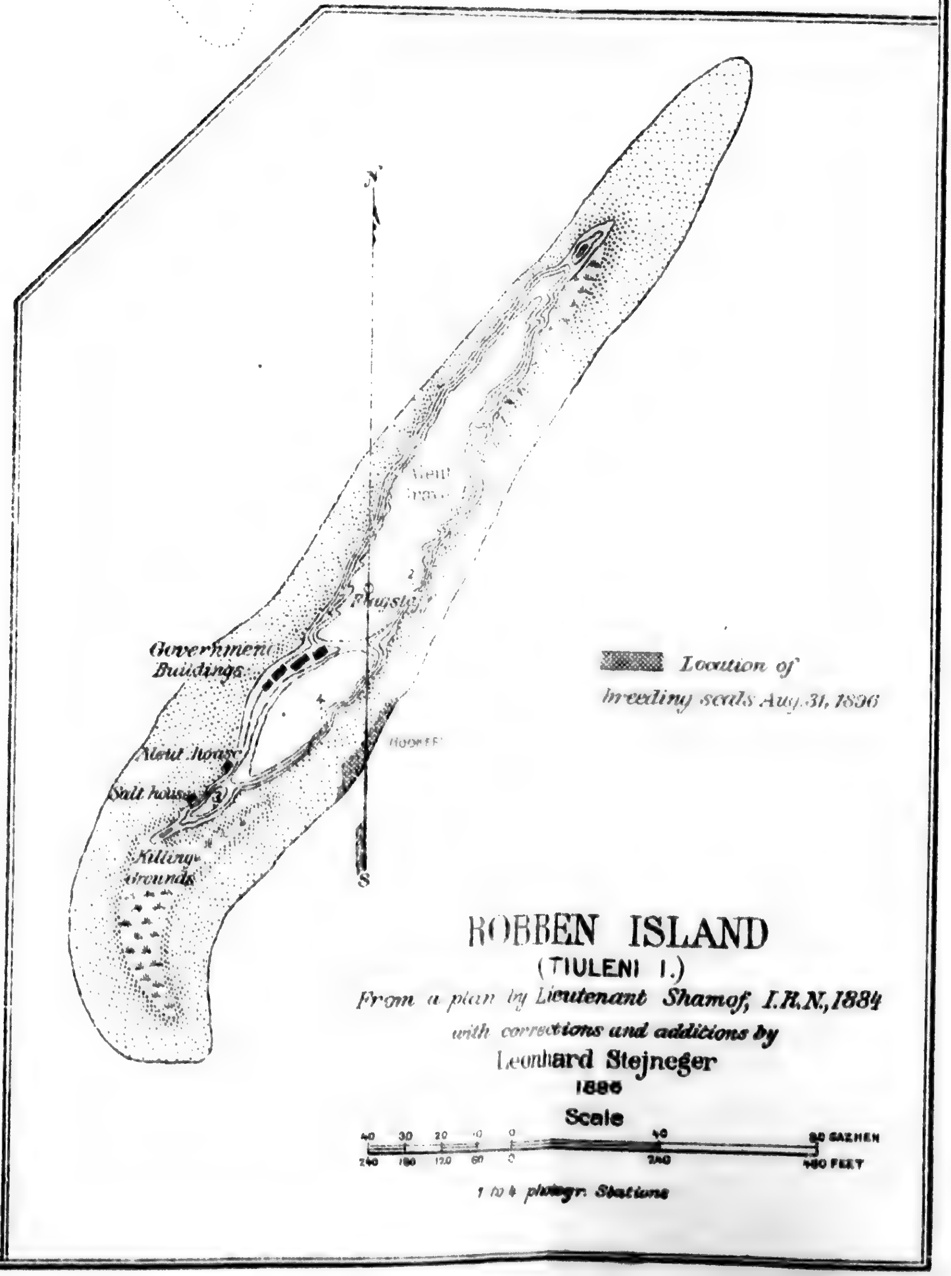
STRAITS BETWEEN ROBBEN ISLAND AND CAPE PATIENCE, SAKHALIN

From a plan by Lieutenant Schultz, I. R. N. 1885

with corrections from a plan by Maksimof & Gilyarovski

Scale

Soundings in Fathoms



ROBBEN ISLAND

(TIULENI I.)

From a plan by Lieutenant Shamof, I.R.N, 1884

with corrections and additions by

Leonhard Stejneger

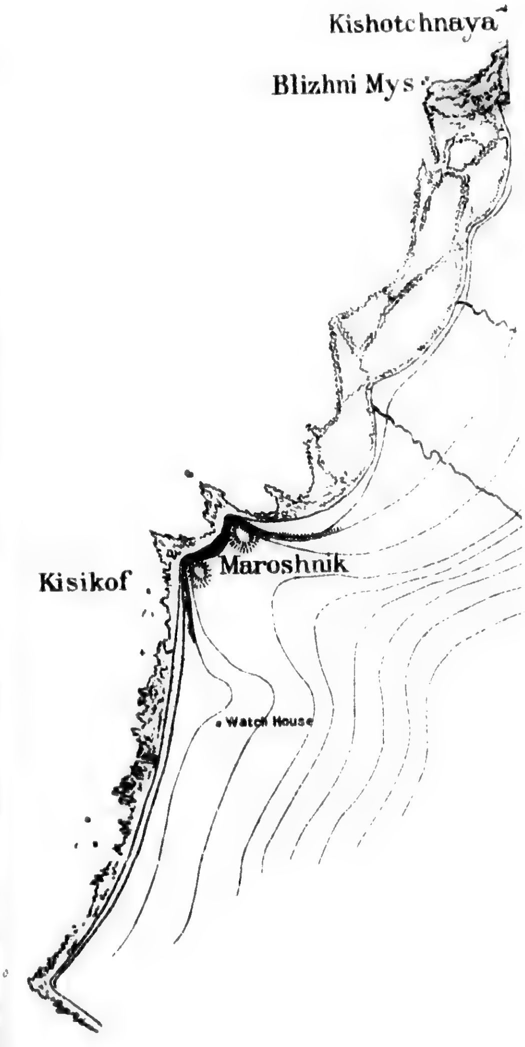
1896

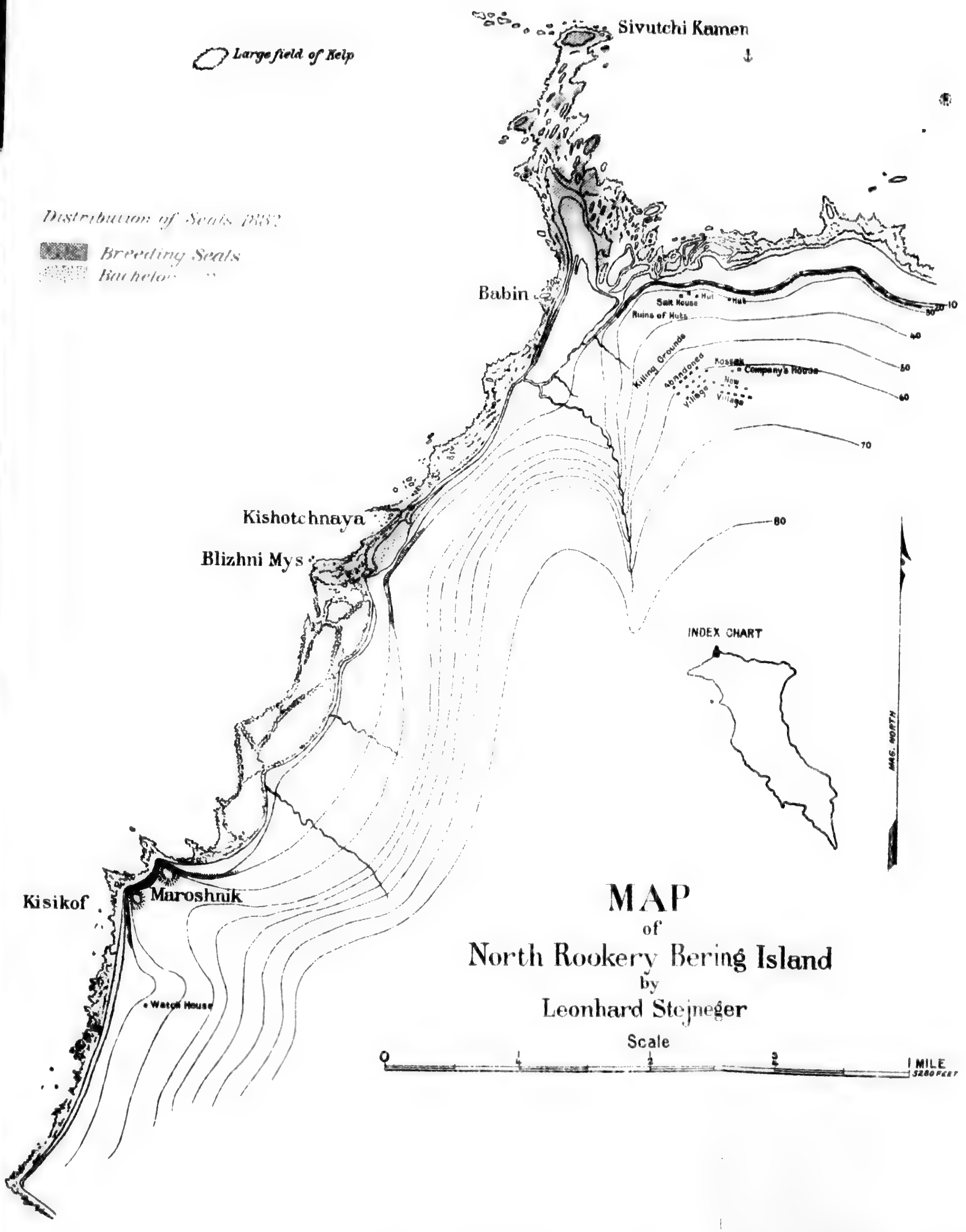
Scale

1 to 4 photogr. Stations

▨ *Location of breeding seals Aug. 31, 1896*

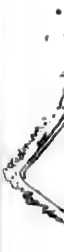
K

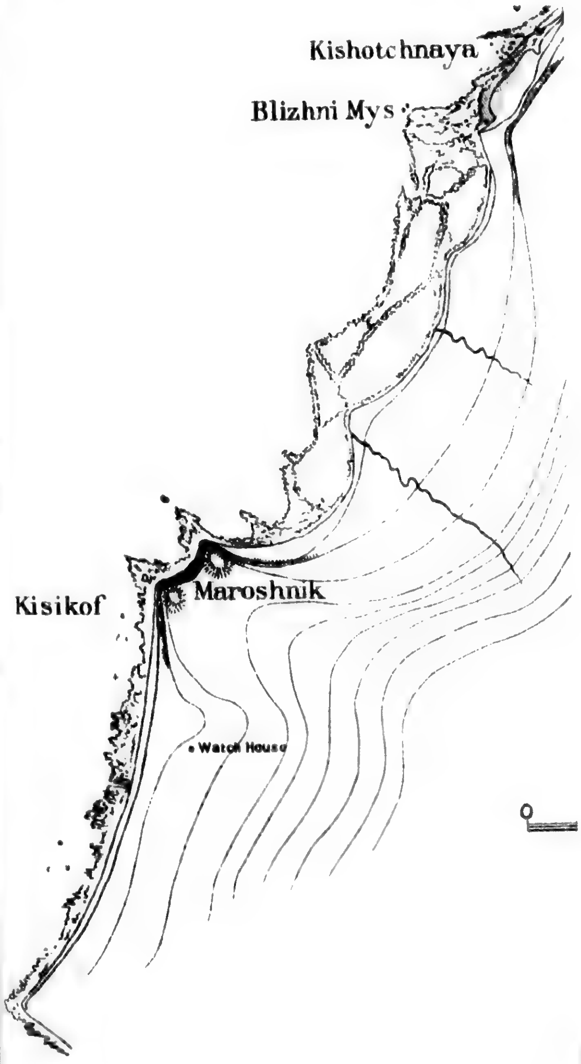

Kishotchnaya
Blizhni Mys
Maroshnik
Kisikof
Watch House

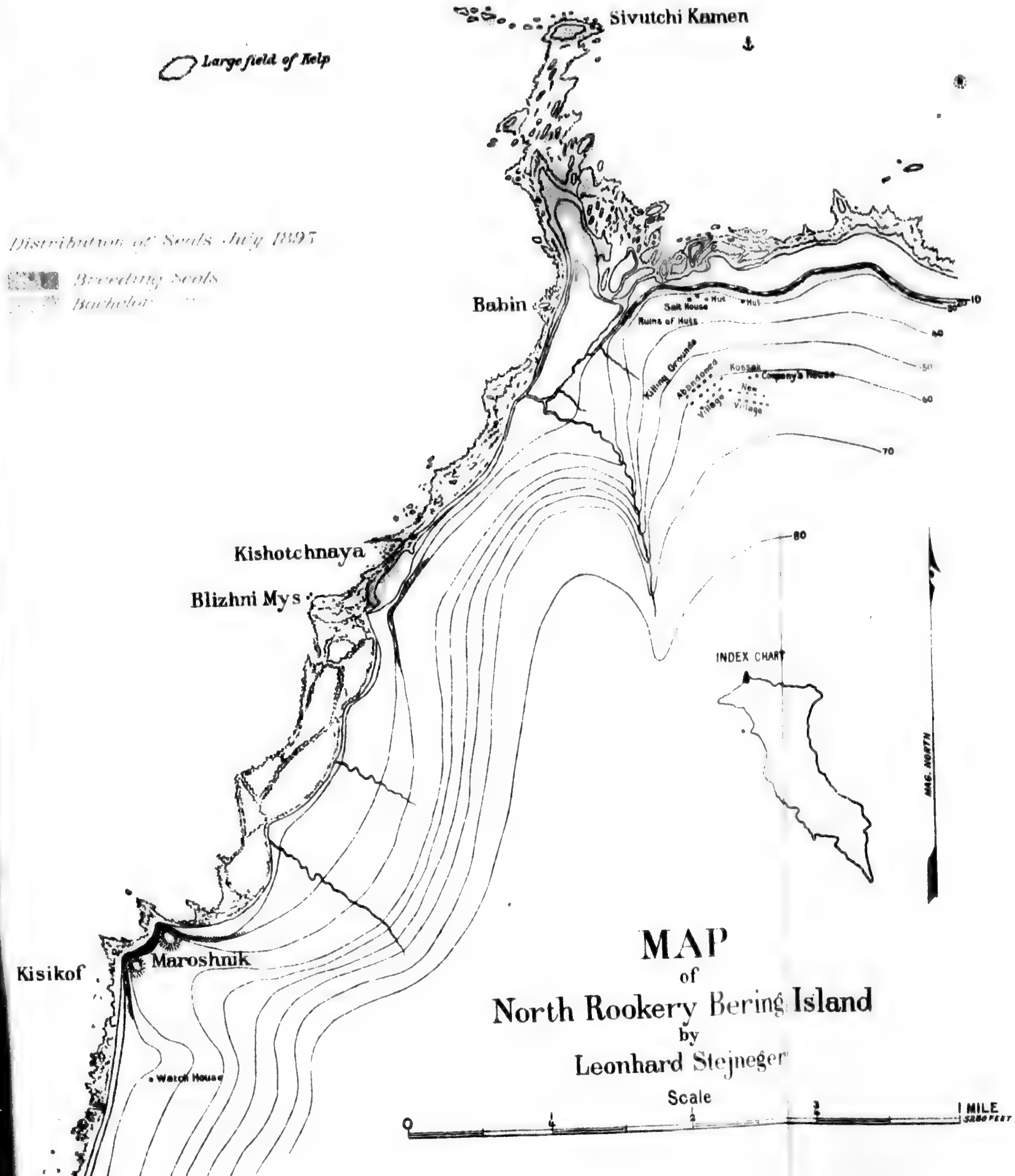


MAP
of
North Rookery Bering Island
by
Leonhard Stejneger

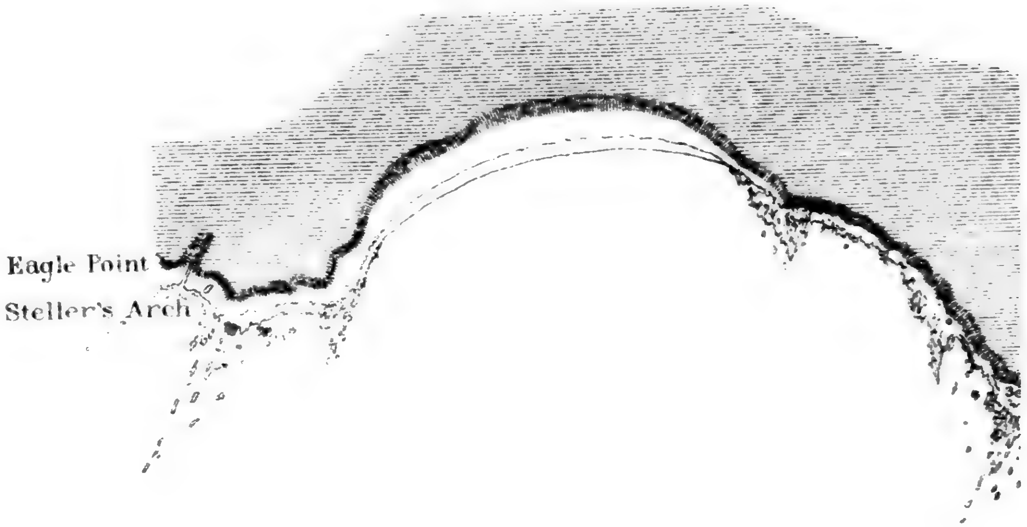
Kisi




Kishotchnaya
Blizhni Mys
Kisikof
Maroshnik
Watch House
0

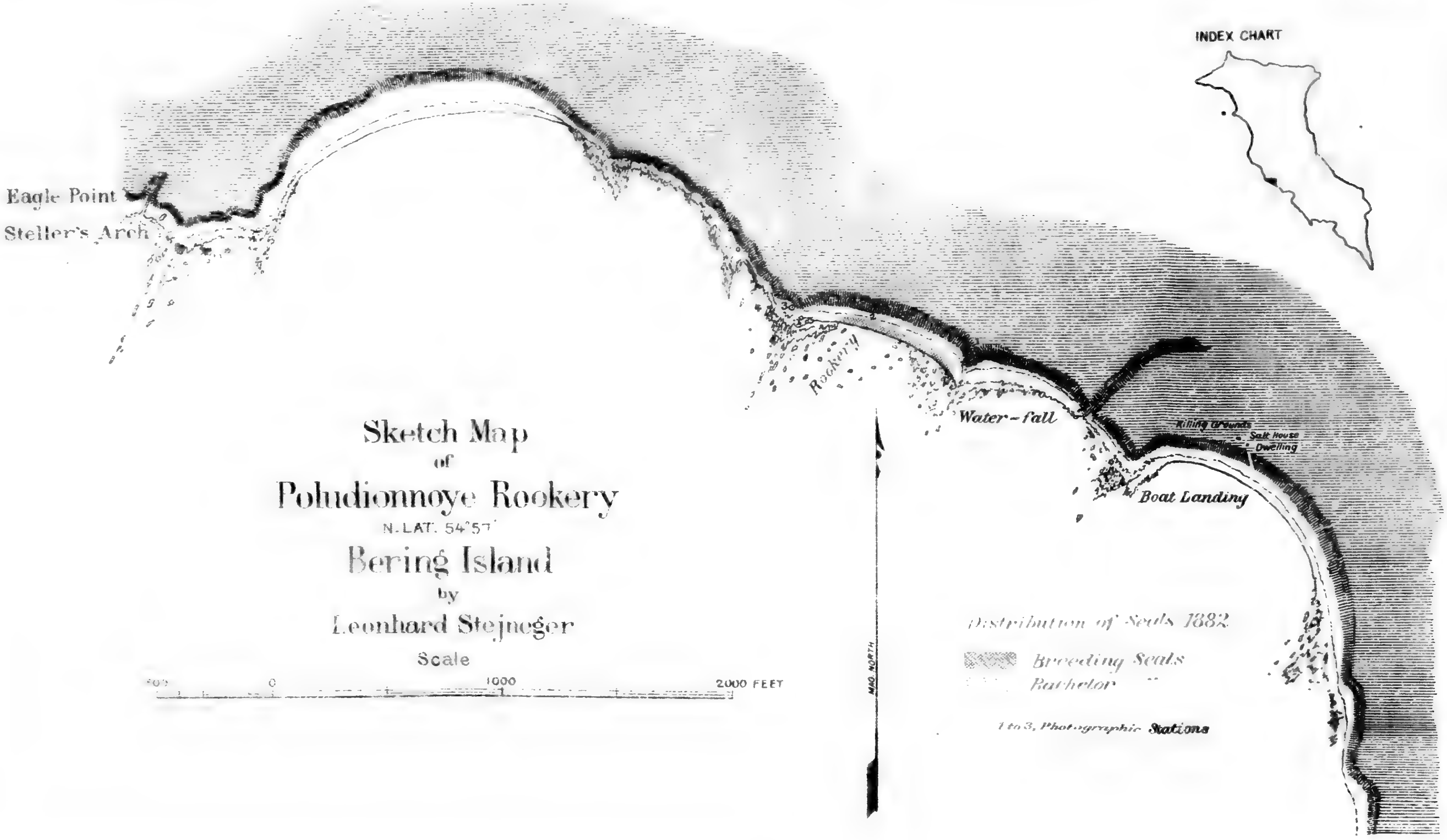


MAP
of
North Rookery Bering Island
by
Leonhard Stejneger

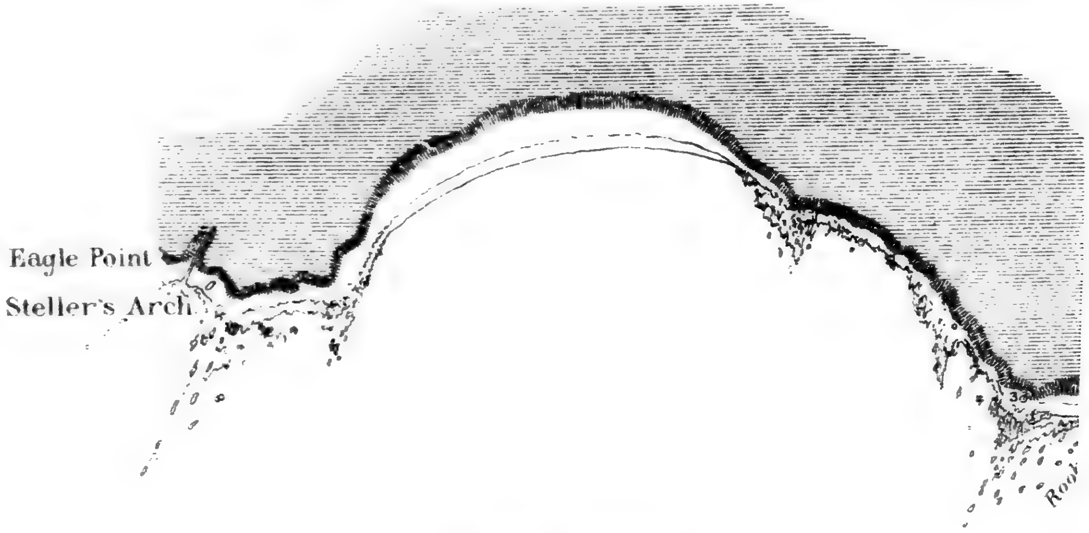


Sketch Map
of
Poludionnoye Rookery
N. LAT. 54°57′

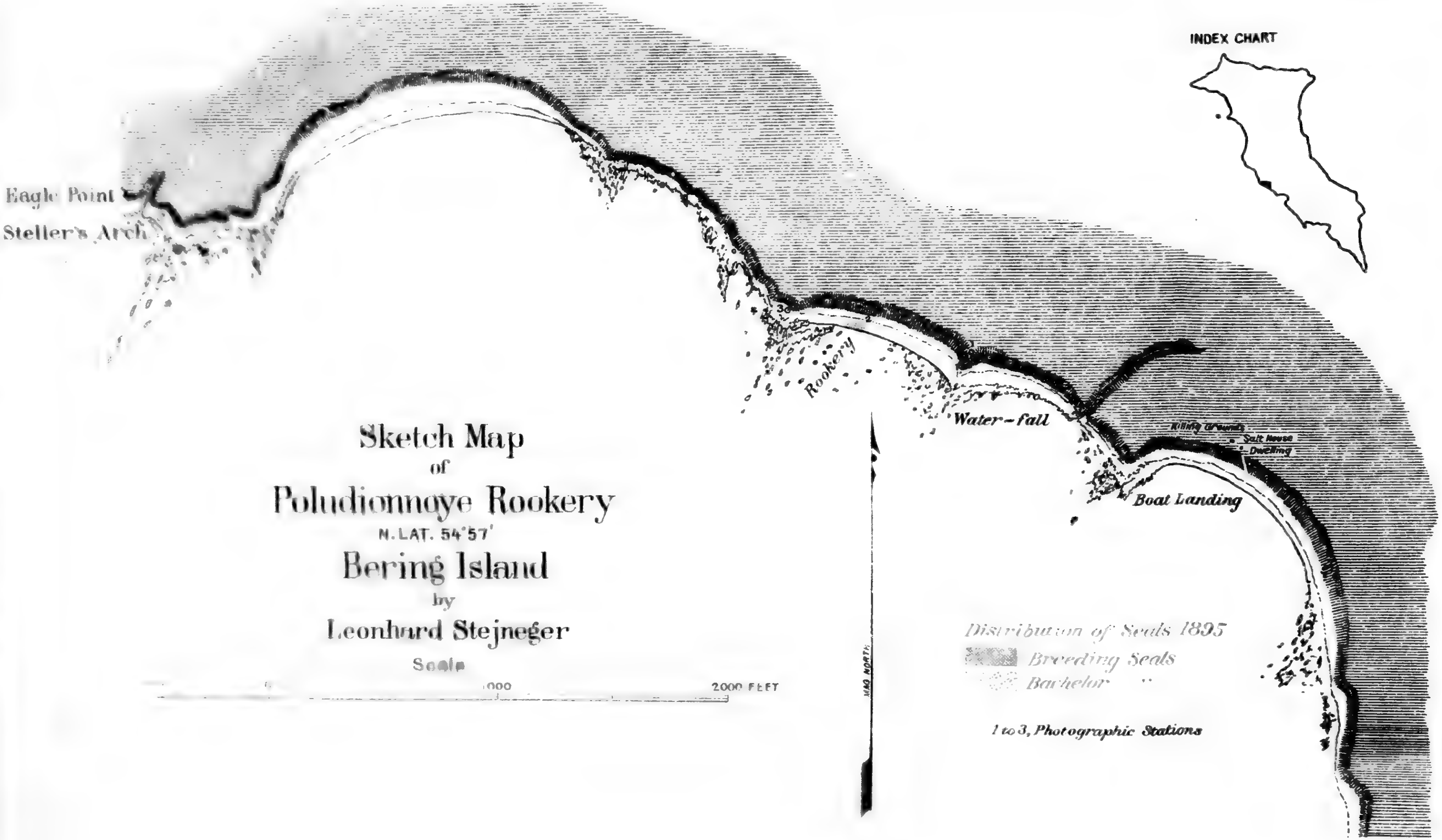
PLATE 93.



Sketch Map
of
Poludionnoye Rookery
N. LAT. 54°57′
Bering Island
by
Leonhard Stejneger



Sketch Map
of
Poludionnoye Rookery
N. LAT. 54°57′
Bering Island



Sketch Map
of
Poludionnoye Rookery
N. LAT. 54°57′
Bering Island
by
Leonhard Stejneger

agle Point
Steller's Arc

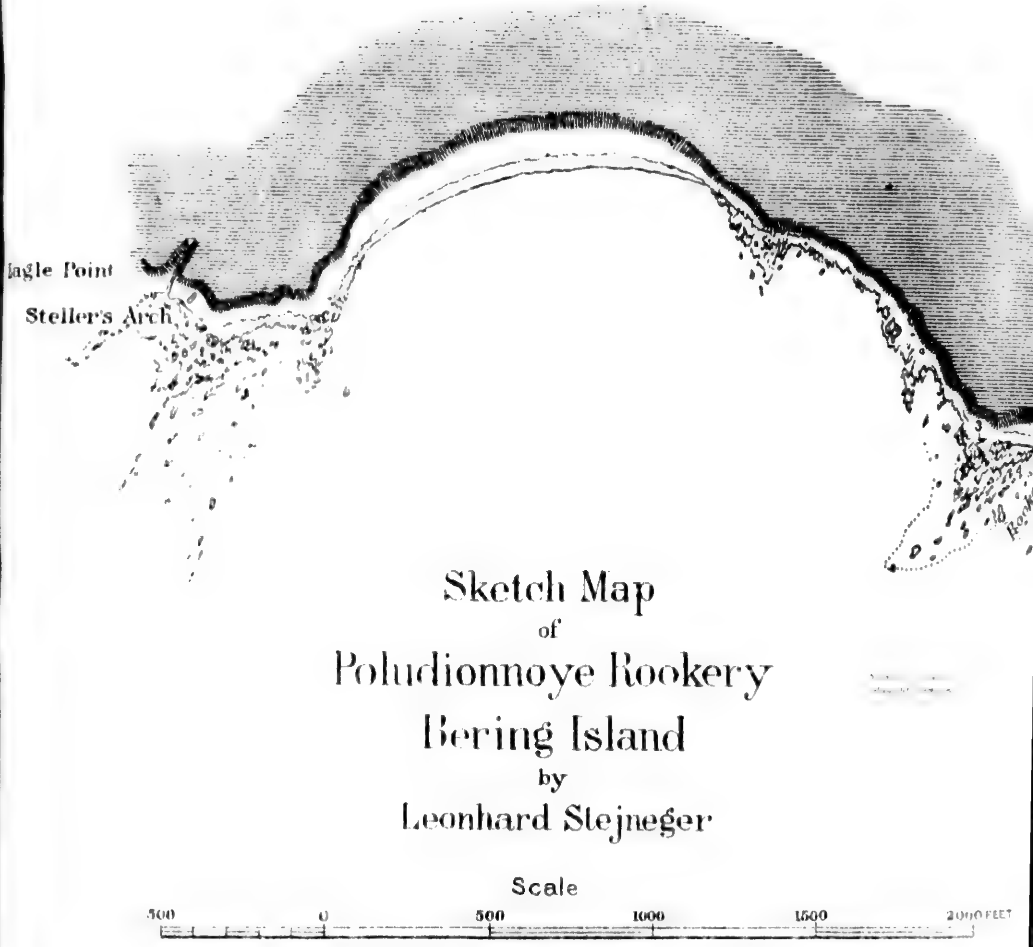
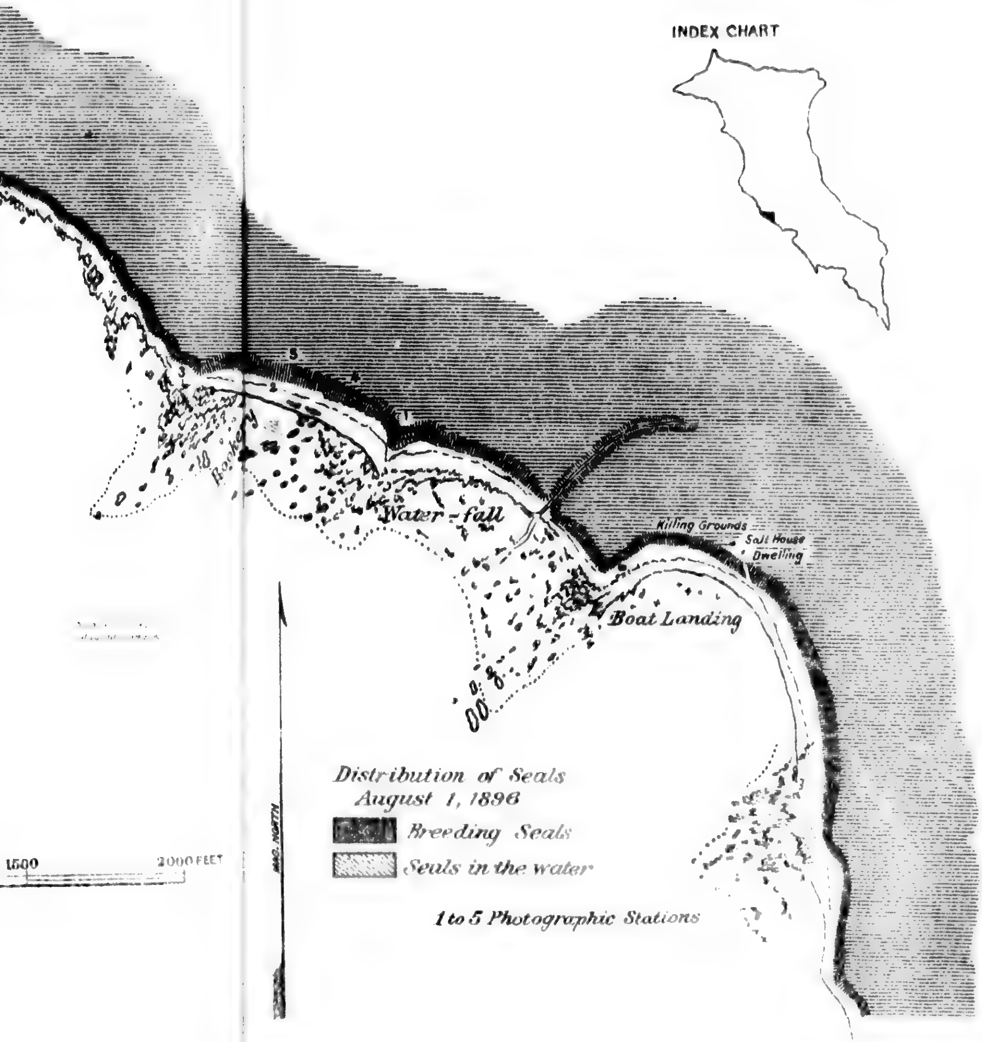
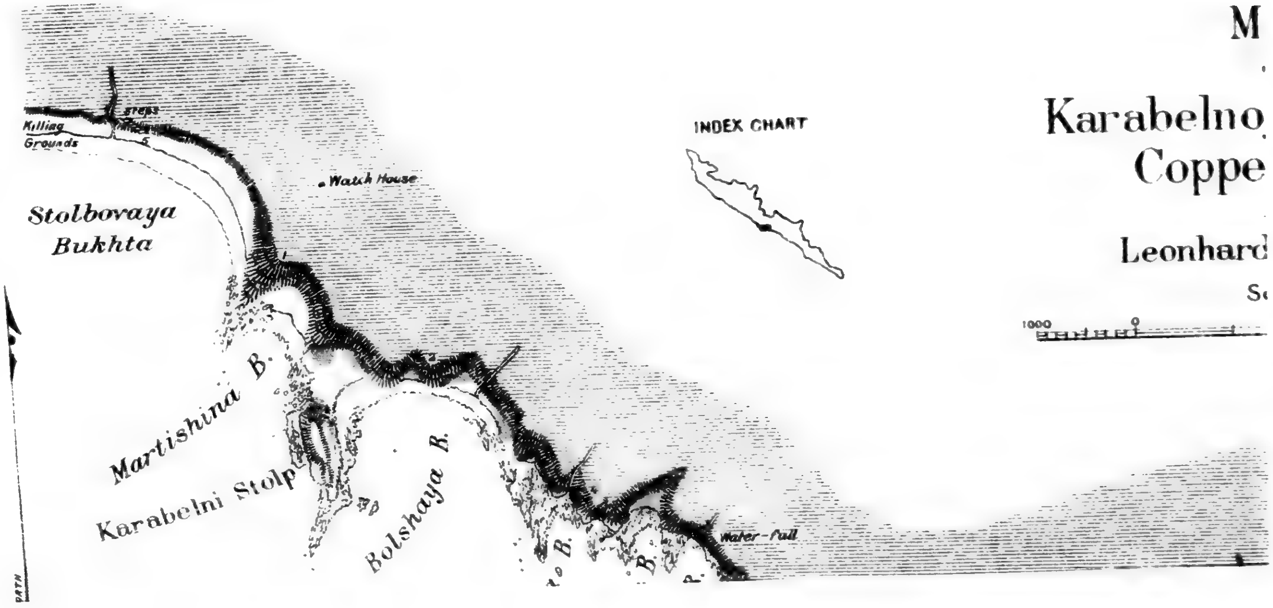
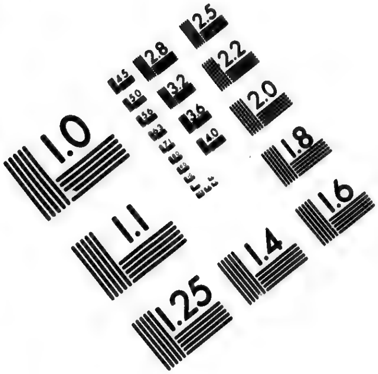

agle Point
Steller's Arch
Rook
Sketch Map
of
Poludionnoye Rookery
Bering Island
by
Leonhard Stejneger
Scale
500
0
500
1000
1500
2000 FEET

PLATE 98.


INDEX CHART
5
4
3
2
1
Rook
Water-fall
Killing Grounds
Salt House
Dwelling
Boat Landing
Distribution of Seals
August 1, 1896
Breeding Seals
Seals in the water
1 to 5 Photographic Stations
1500
2000 FEET
MAG. NORTH


M
Karabelno
Coppe
Leonhard
S
1000
0
INDEX CHART
Killing Grounds
Steps
Watch House
Stolbovaya Bukhta
Martishina B.
Karabelni Stolp
Bolshaya B.
B.
B.
Water-Fall
North



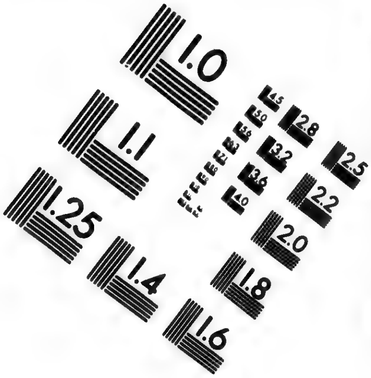
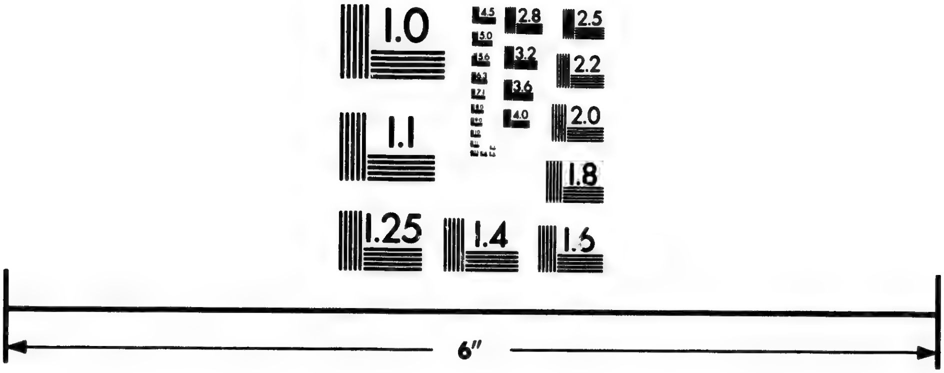
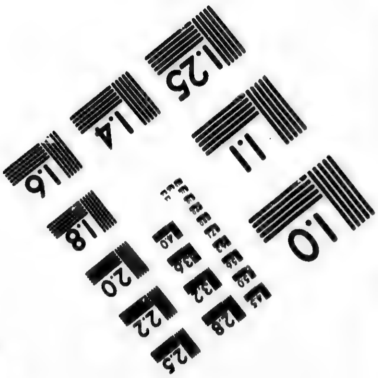


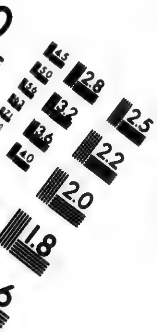
IMAGE EVALUATION TEST TARGET (MT-3)





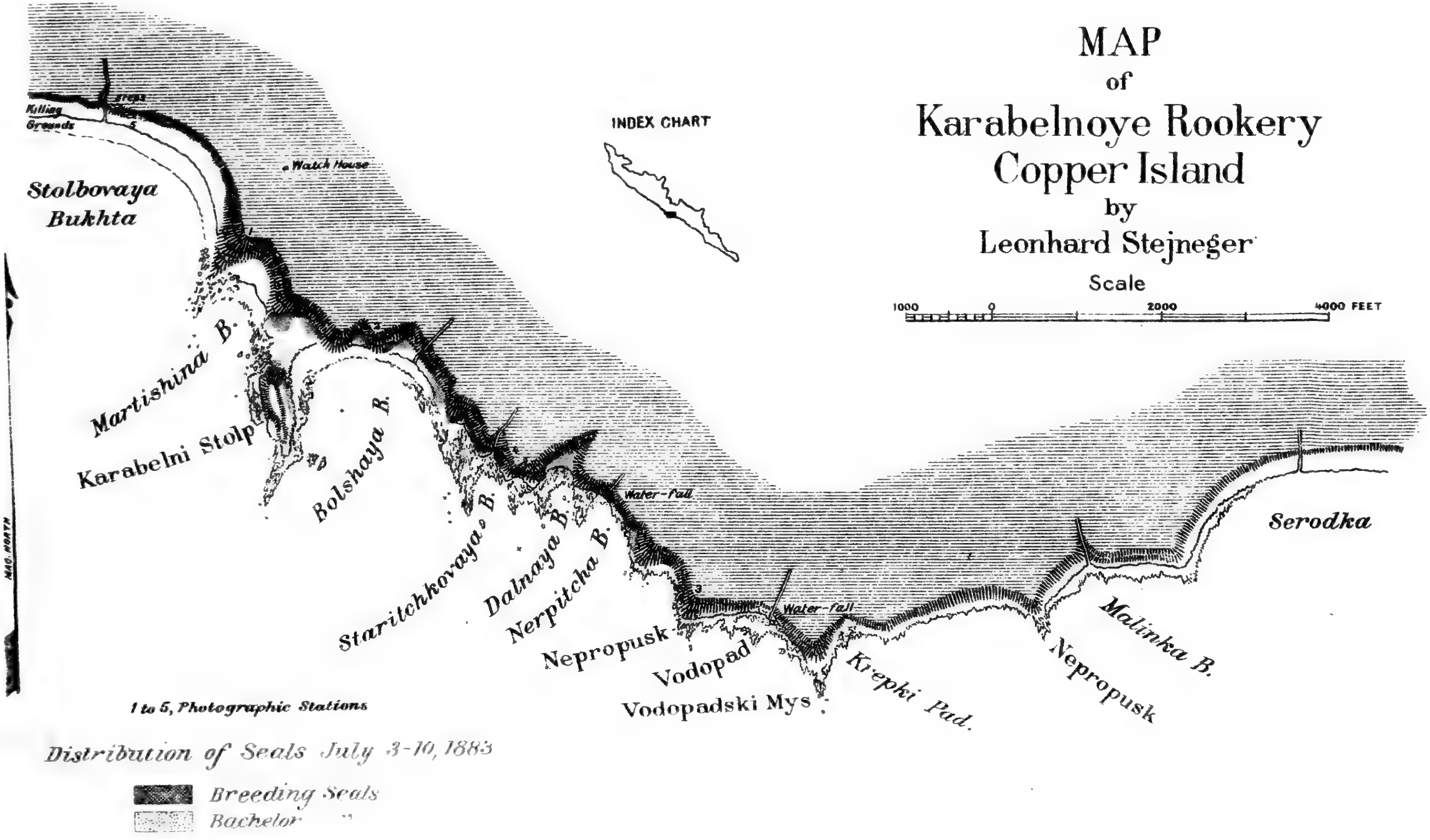
Photographic
Sciences
Corporation

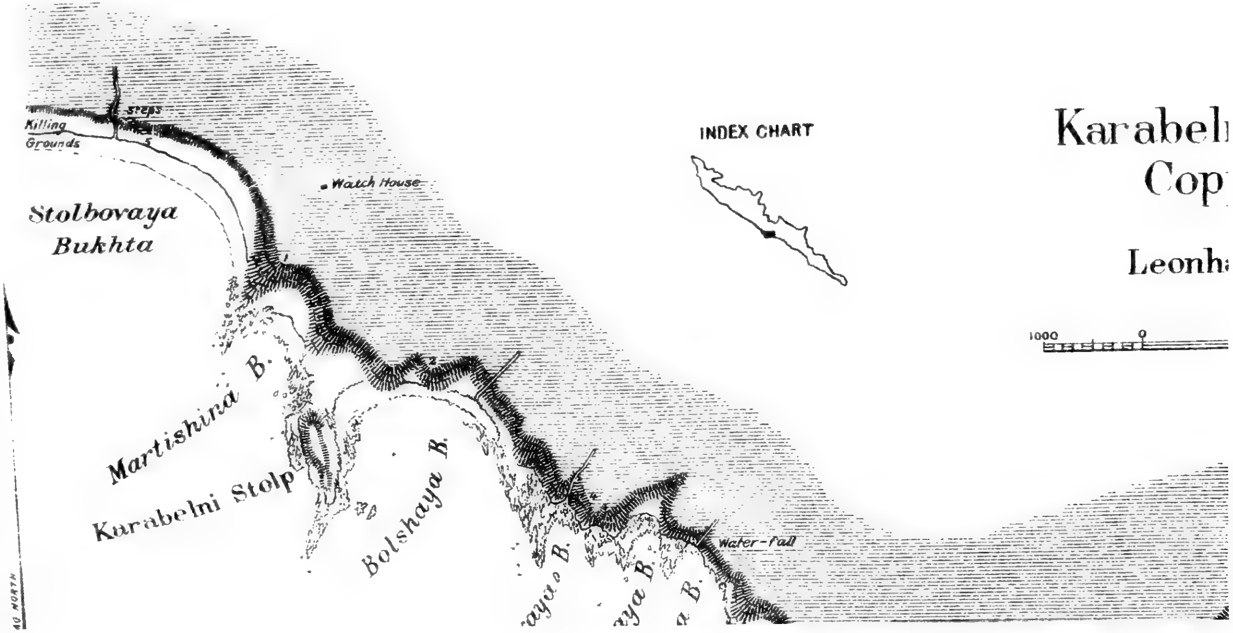
23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503

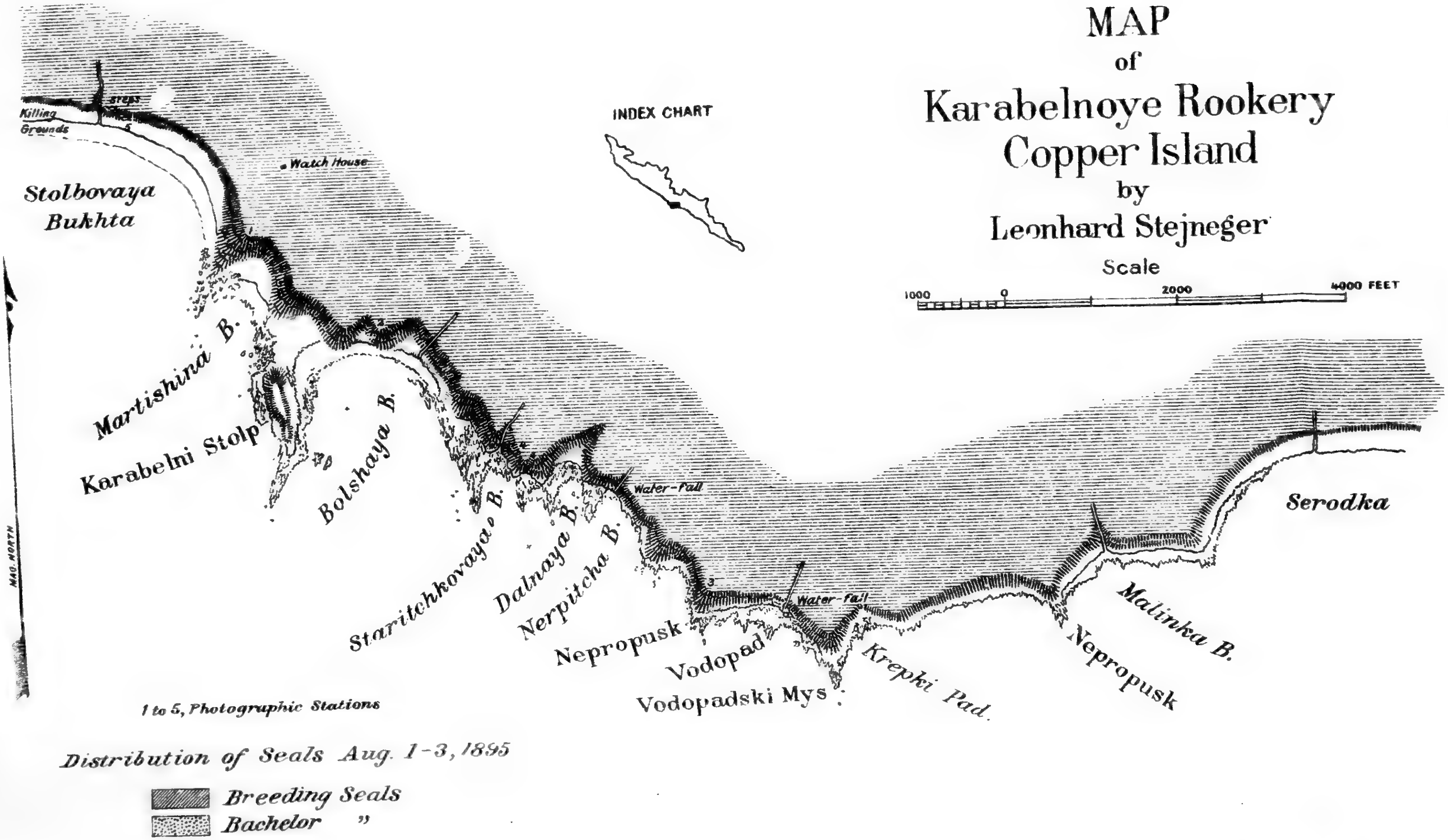

4.5
5.0
5.6
6.3
3.2
3.6
4.0
2.8
2.5
2.2
2.0
1.8

1.1
1.0

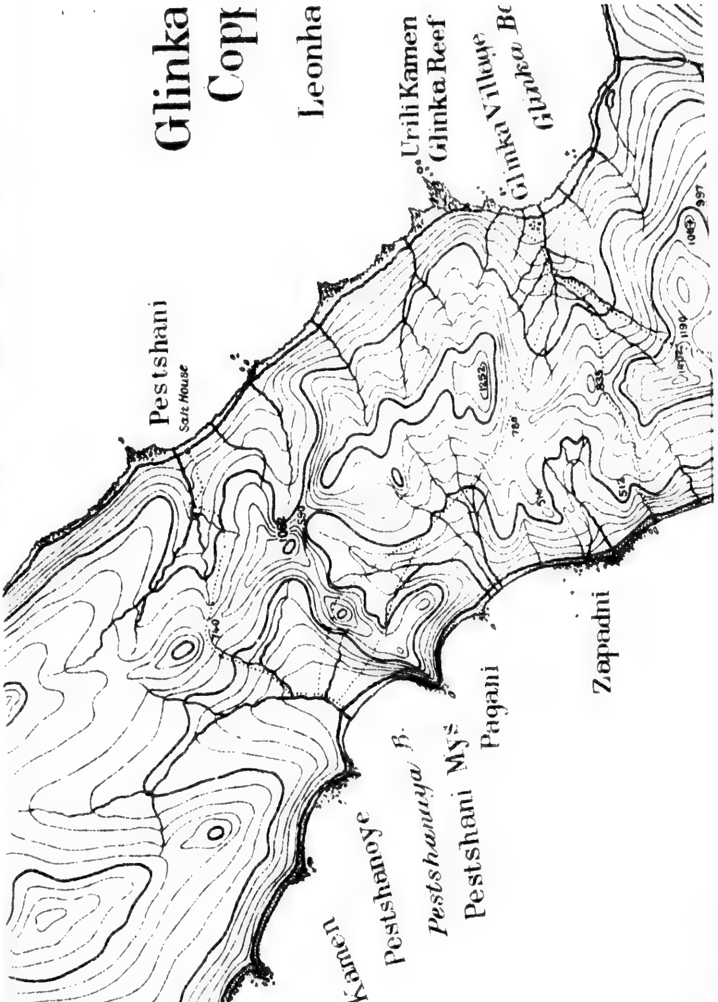
MAP
of
Karabelnoye Rookery
Copper Island
by
Leonhard Stejneger



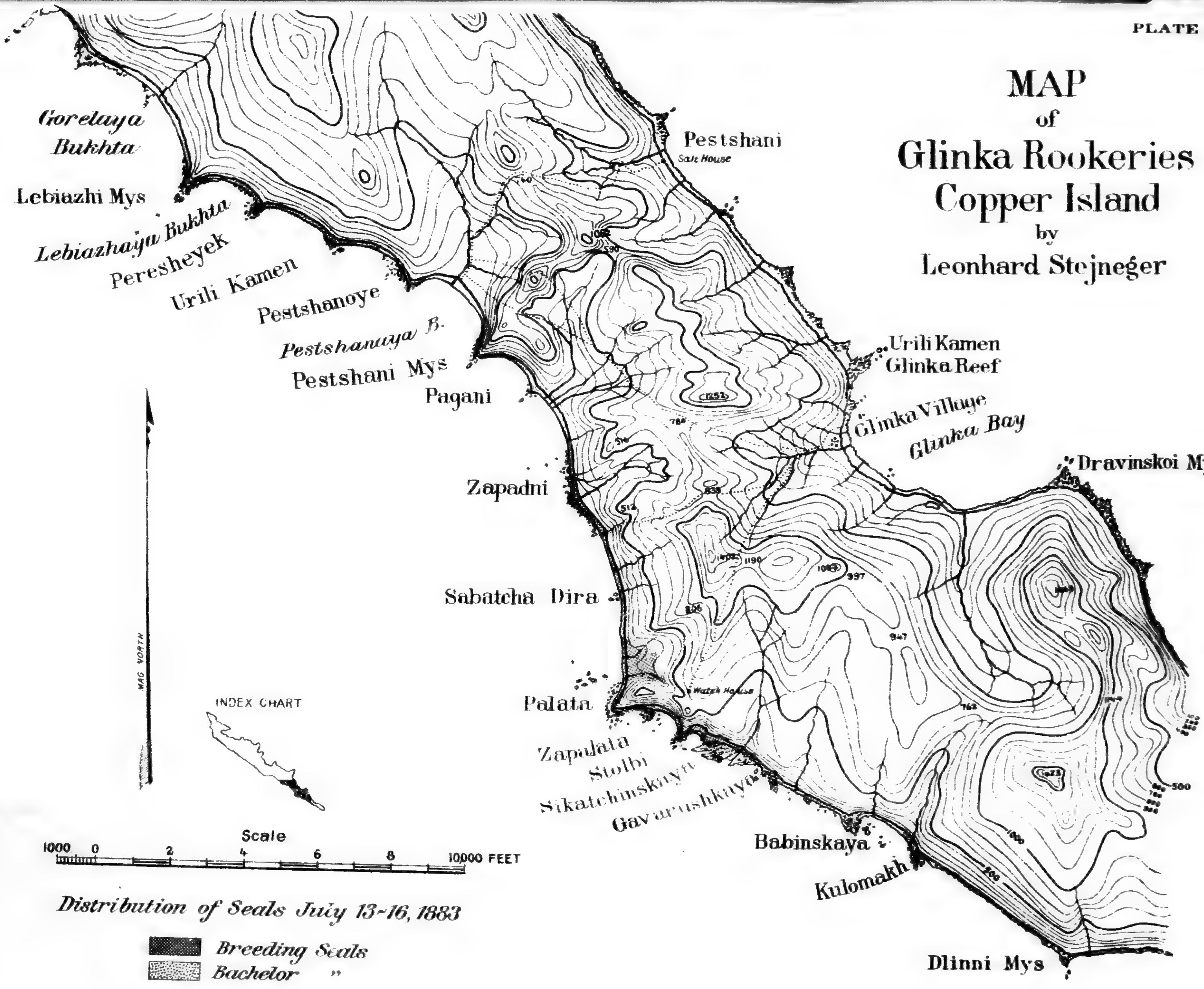

Karabel
Cop
Leonh
INDEX CHART
1000
0
Killing Grounds
Steps
Watch House
Stolbovaya Bukhta
Martishina B.
Karabelni Stolp
Bolshaya B.
ayaya B.
aya B.
a B.
Water-Fall
MAG NORTH



MAP
of
Karabelnoye Rookery
Copper Island
by
Leonhard Stejneger


Glinka
Copp
Leonha
Urili Kamen
Glinka Reef
Glinka Village
Glinka B
Pestshani
Salt House
Pagani
Zapadni
Pestshanaya B.
Pestshani Mys
Pestshanoye
Urili Kamen
Pereshcyek
Lebiazhaya Bukhta
Lebiazhi Mys
Gorelaya
Bukhta
997
1084
1190
833
788
514
512
1080
530
740

MAP
of
Glinka Rookeries Copper Island
by
Leonhard Stejneger



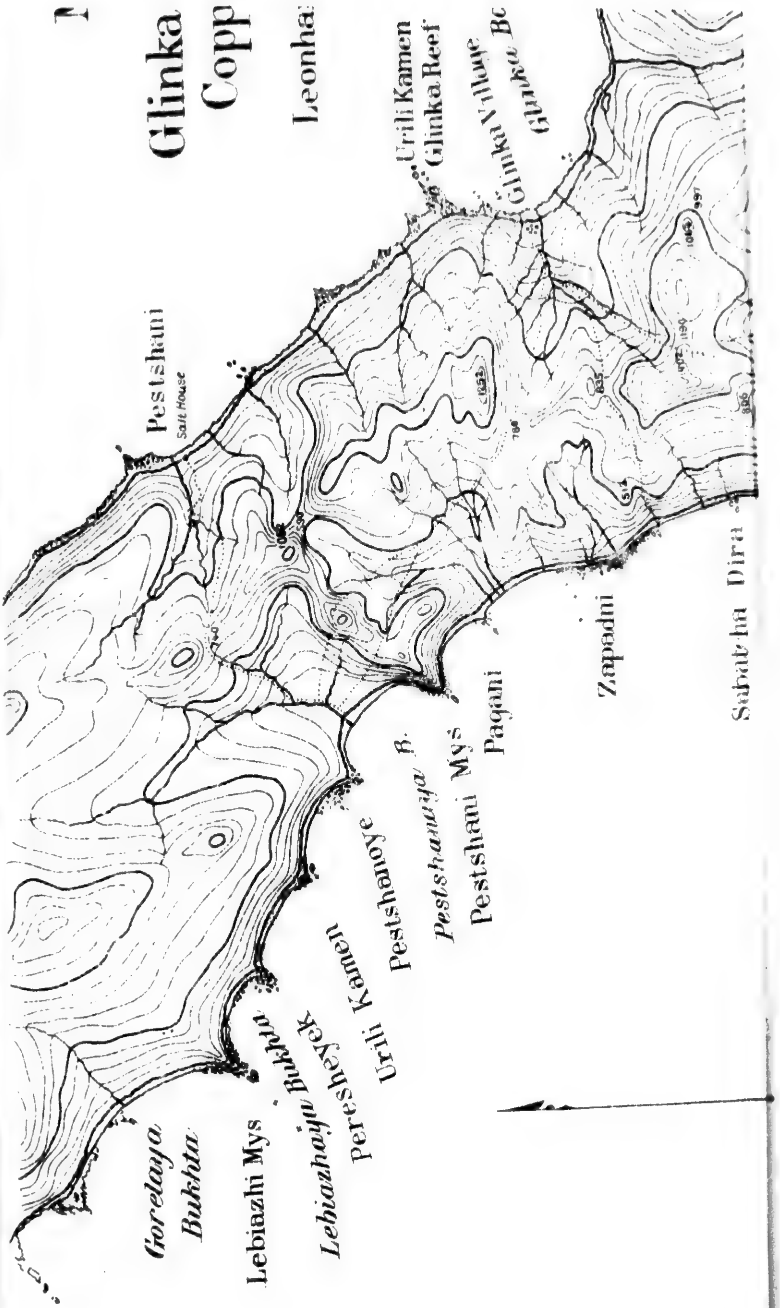
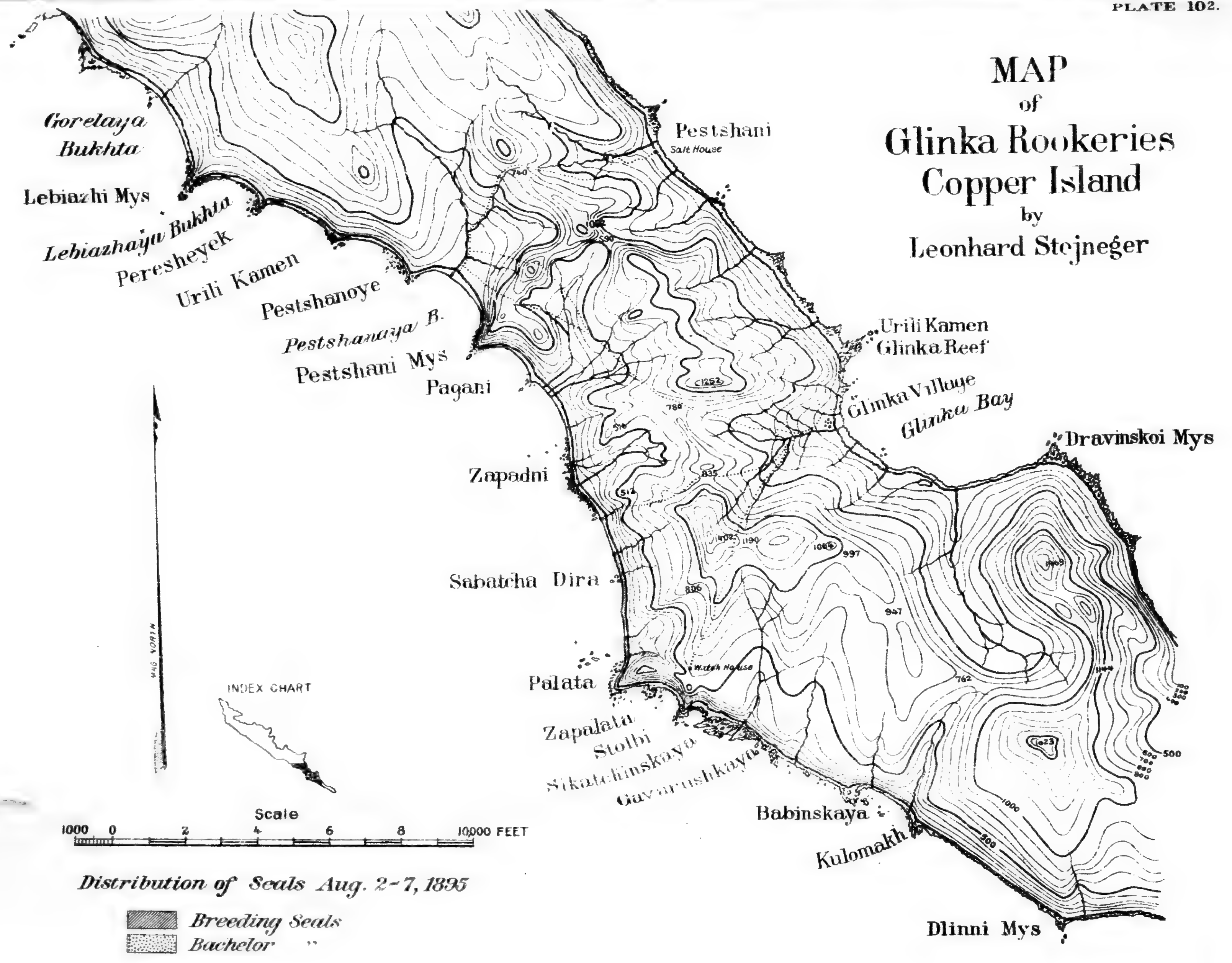

Glinka
Copp
Leonha
Urili Kamen
Glinka Reef
Glinka Village
Glinka Bo
Pestshani
Salt House
Gorelaya Bukhta
Lebiazhi Mys
Lebiazhaya Bukhta
Pereesheyek
Urili Kamen
Pestshanoye
Pestshanaya R.
Pestshani Mys
Pestshani Bo
Pagani
Zapadni
Sabatcha Dira

PLATE 102.

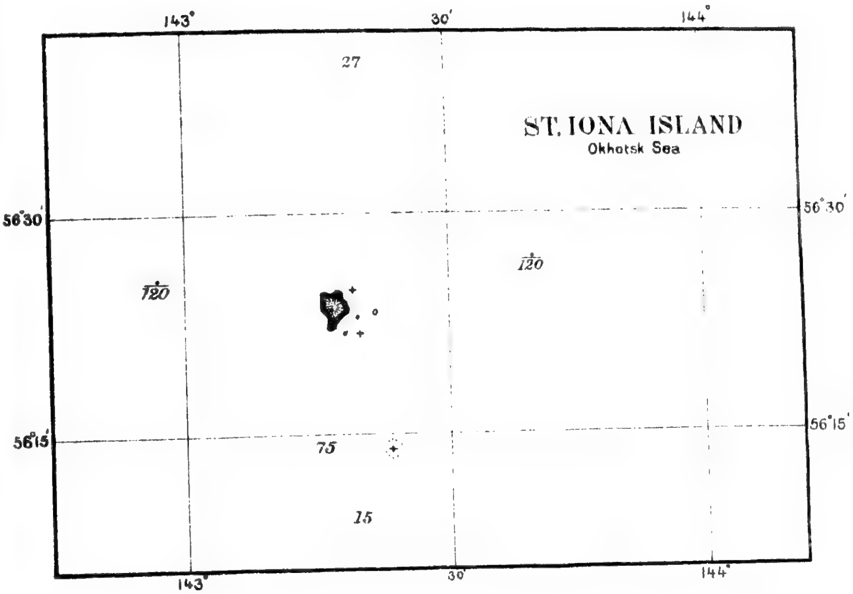


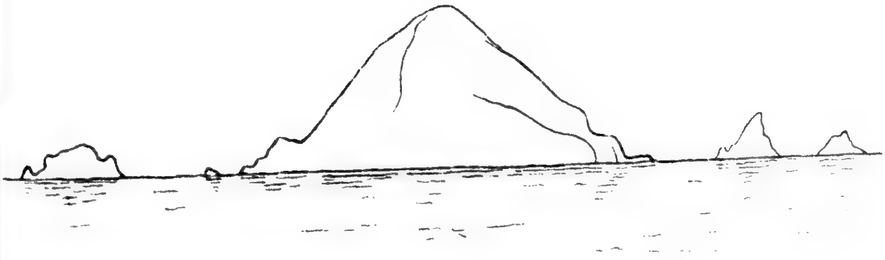
MAP of Glinka Rookeries Copper Island

by

Leonhard Stejneger

Distribution of Seals Aug. 2-7, 1895





ST. IONA ISLAND

N.N.E. 6 Miles

Sketch by Capt. C.E. Lindquist
August 12, 1896

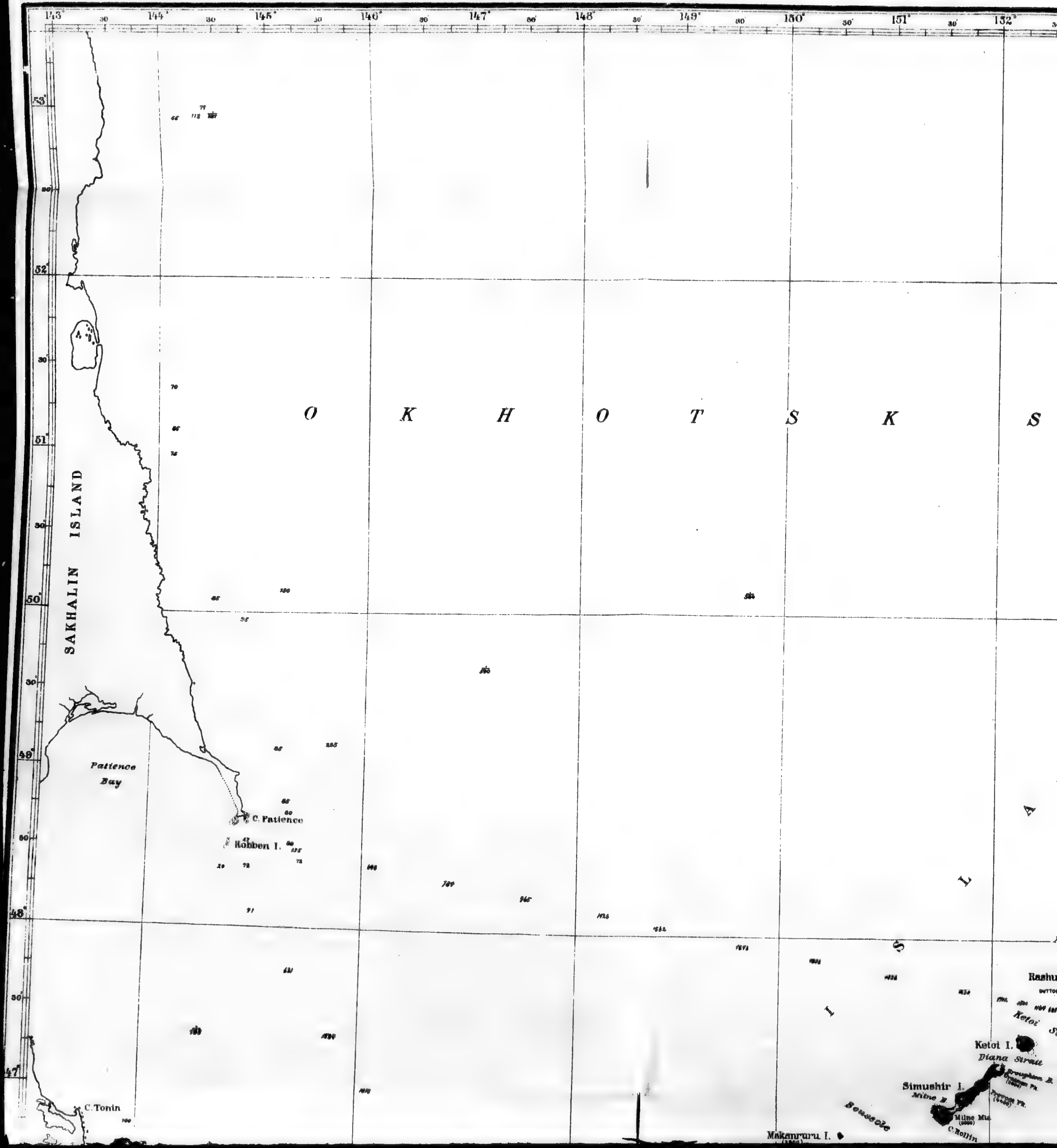
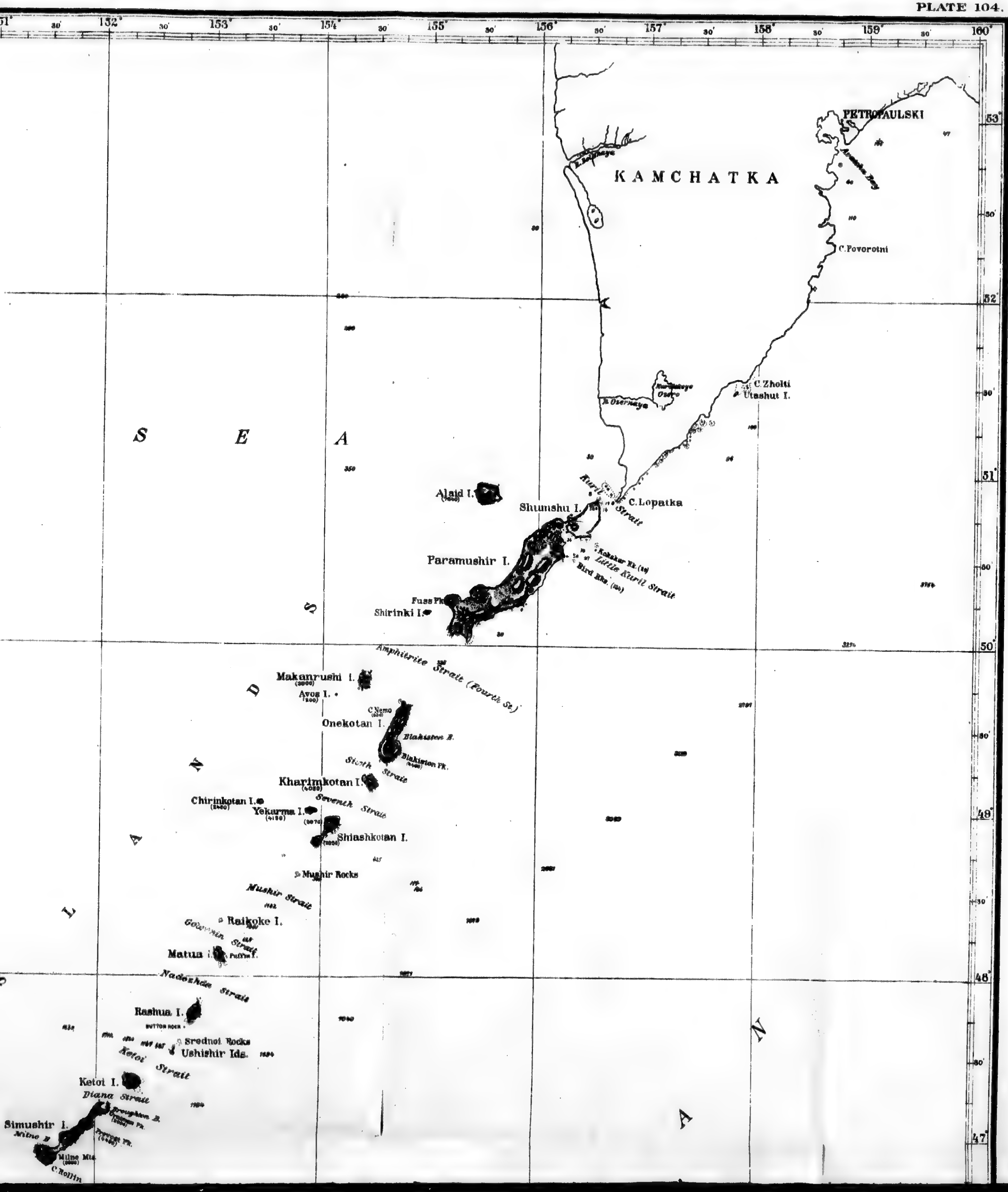
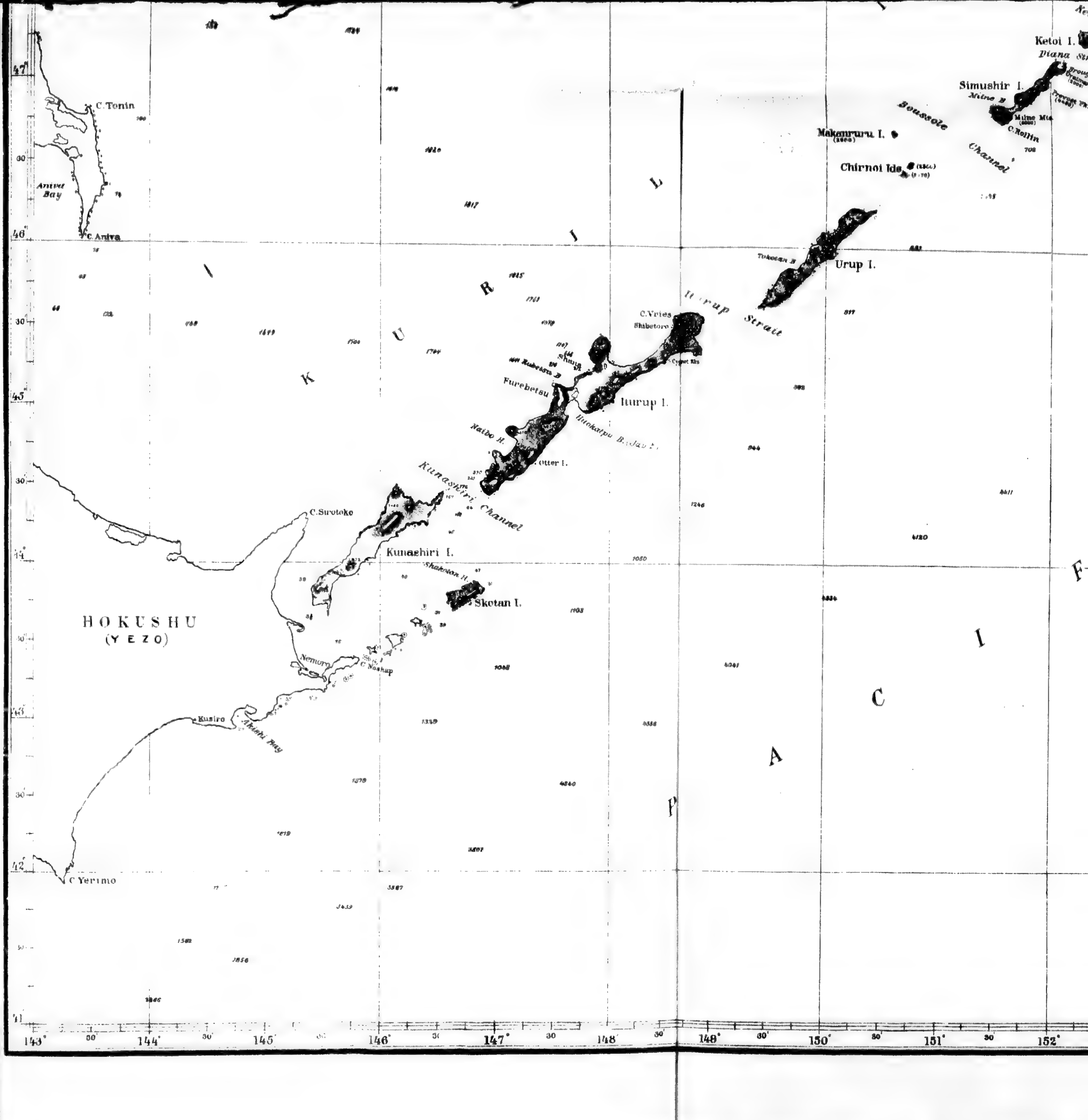
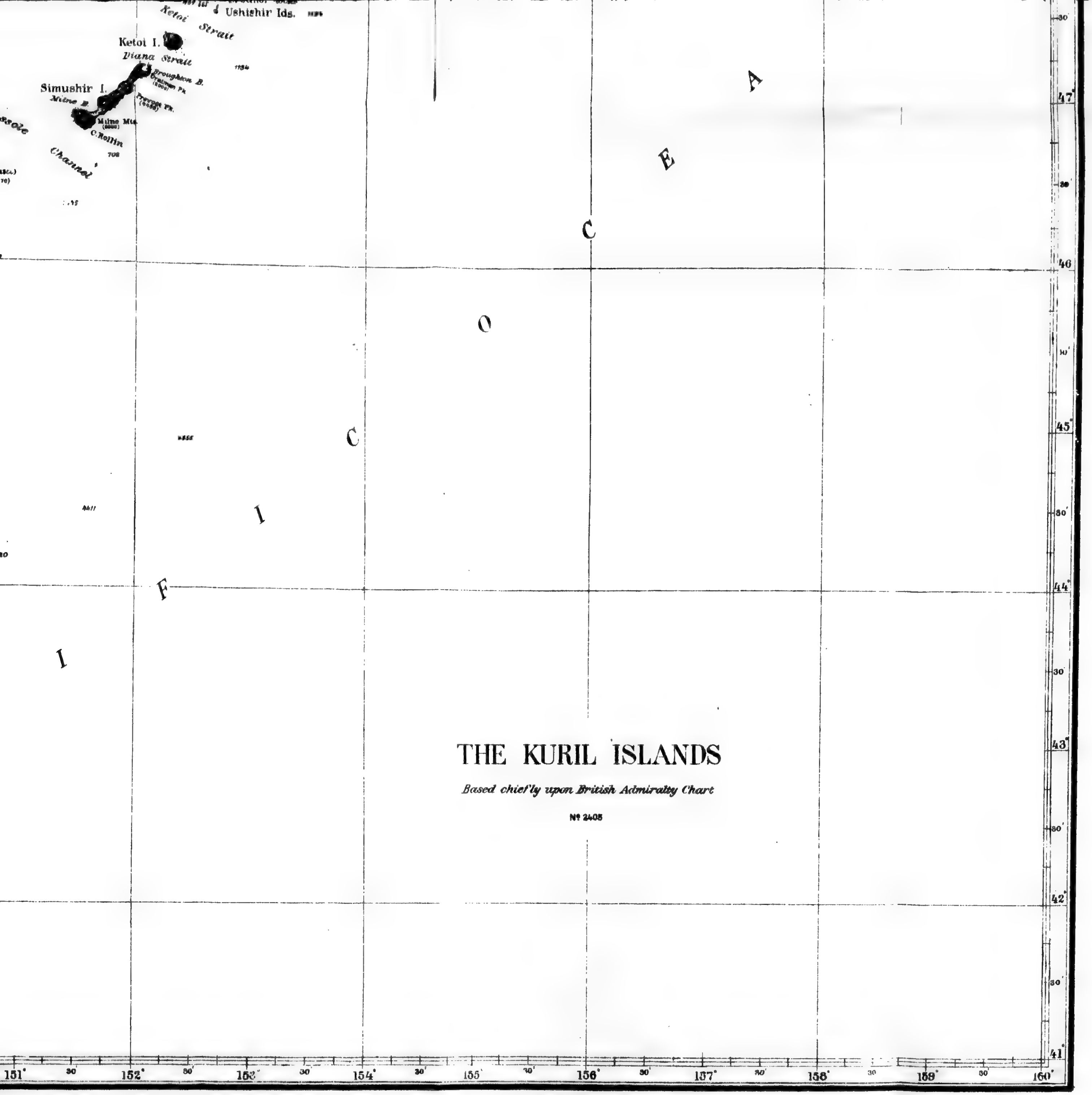

143°
144°
145°
146°
147°
148°
149°
150°
151°
152°
53°
52°
51°
50°
49°
48°
47°
O K H O T S K S
SAKHALIN ISLAND
Patience Bay
C. Patience
Robben I.
C. Tonin
A L I S
Rashu
Ketoi
Ketoi I.
Diana Strait
Broughton B.
Simushir I.
Milne B.
Milne Mt.
C. Rollin
Boussole
Makanruru I.

PLATE 104.


KAMCHATKA
PETROPAULSKI
Avatcha Bay
C. Povorotni
R. Bolshaya
Kurilskaye Osero
R. Ozernaya
C. Zholti
Utashut I.
C. Lopatka
Kuril Strait
Shumshu I.
Alaid I.
Paramushir I.
Kokskar Rk.
Little Kuril Strait
Bird Rks.
Fuss Pk.
Shirinki I.
Amphitrite Strait (Fourth St.)
Makanrushi I.
Avos I.
C. Nemo
Onekotan I.
Blakiston B.
Blakiston Pk.
Sixth Strait
Kharimkotan I.
Seventh Strait
Chirinkotan I.
Yekarma I.
Shiashkotan I.
Mushir Rocks
Mushir Strait
Raikoke I.
Golovnin Strait
Matua I.
Pillar I.
Nadezhda Strait
Rashua I.
Button Rock
Srednoi Rocks
Ushishir Ids.
Ketoi Strait
Ketoi I.
Diana Strait
Simushir I.
Broughton B.
Milne B.
Prevost Pk.
Milne Mts.
C. Rollin
S E A
S
D
N
A
L
N
A
151°
30'
152°
153°
154°
155°
156°
157°
158°
159°
160°
53°
52°
51°
50°
49°
48°
47°

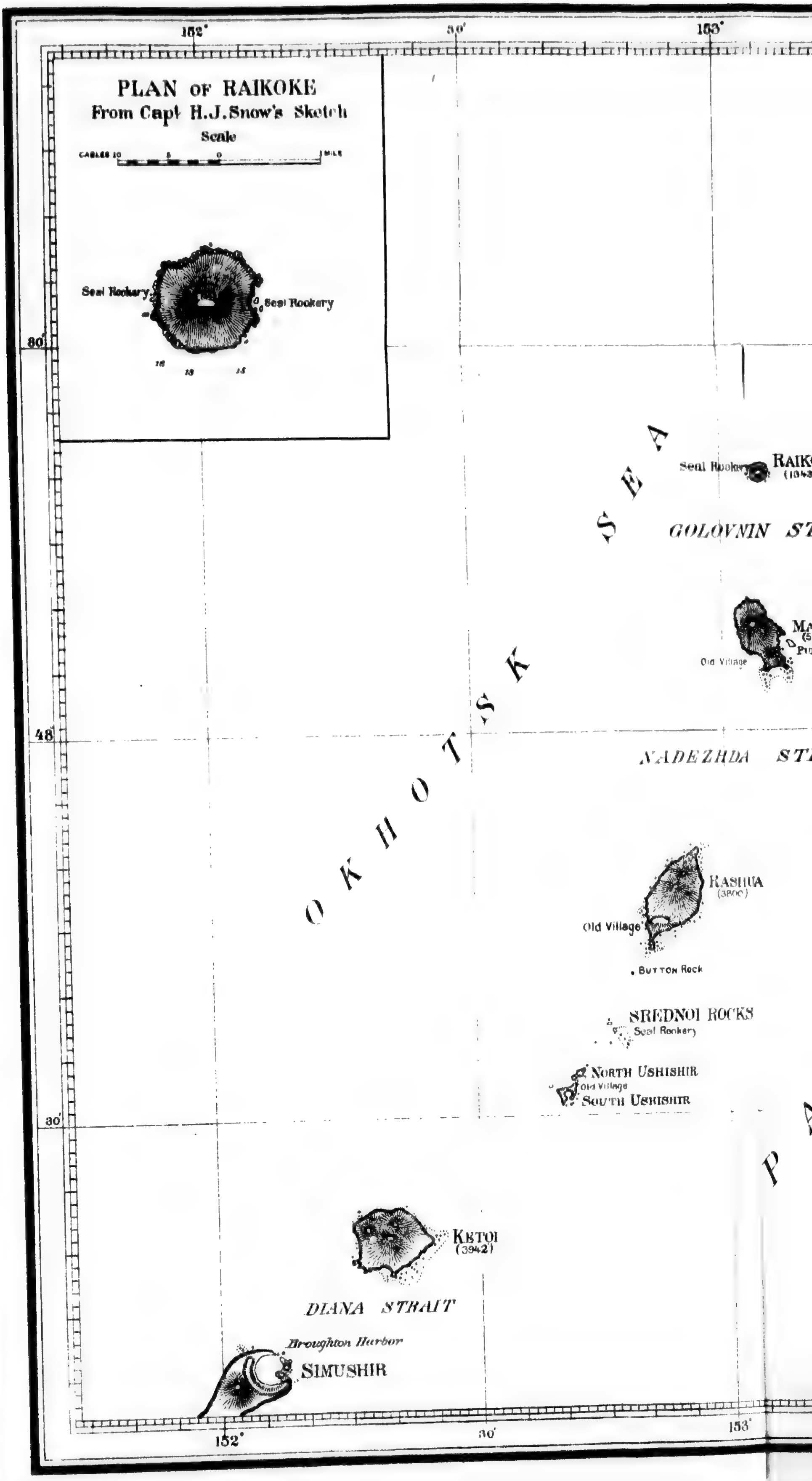

Ketoi I.
Diana Str.
Simushir I.
Milne B.
Milne Mts
C.Rollin
Boussole Channel
Makanruru I.
Chirnoi Ids
K U R I L
C.Tonin
Aniva Bay
C.Aniva
Urup I.
Tokotan B
Iturup Strait
C.Vries
Shibetoro
Shana
Rubetsu B
Furebetsu
Iturup I.
Hitokappu B.
Naibo H.
Otter I.
Kunashiri Channel
C.Surotoko
Kunashiri I.
Shakotan H.
Skotan I.
HOKUSHU
(YEZO)
Nemuro
C.Noshap
Kusiro
Akishi Bay
C.Yerimo
P A C I F
47°
46°
45°
44°
43°
42°
41°
143°
144°
145°
146°
147°
148°
149°
150°
151°
152°

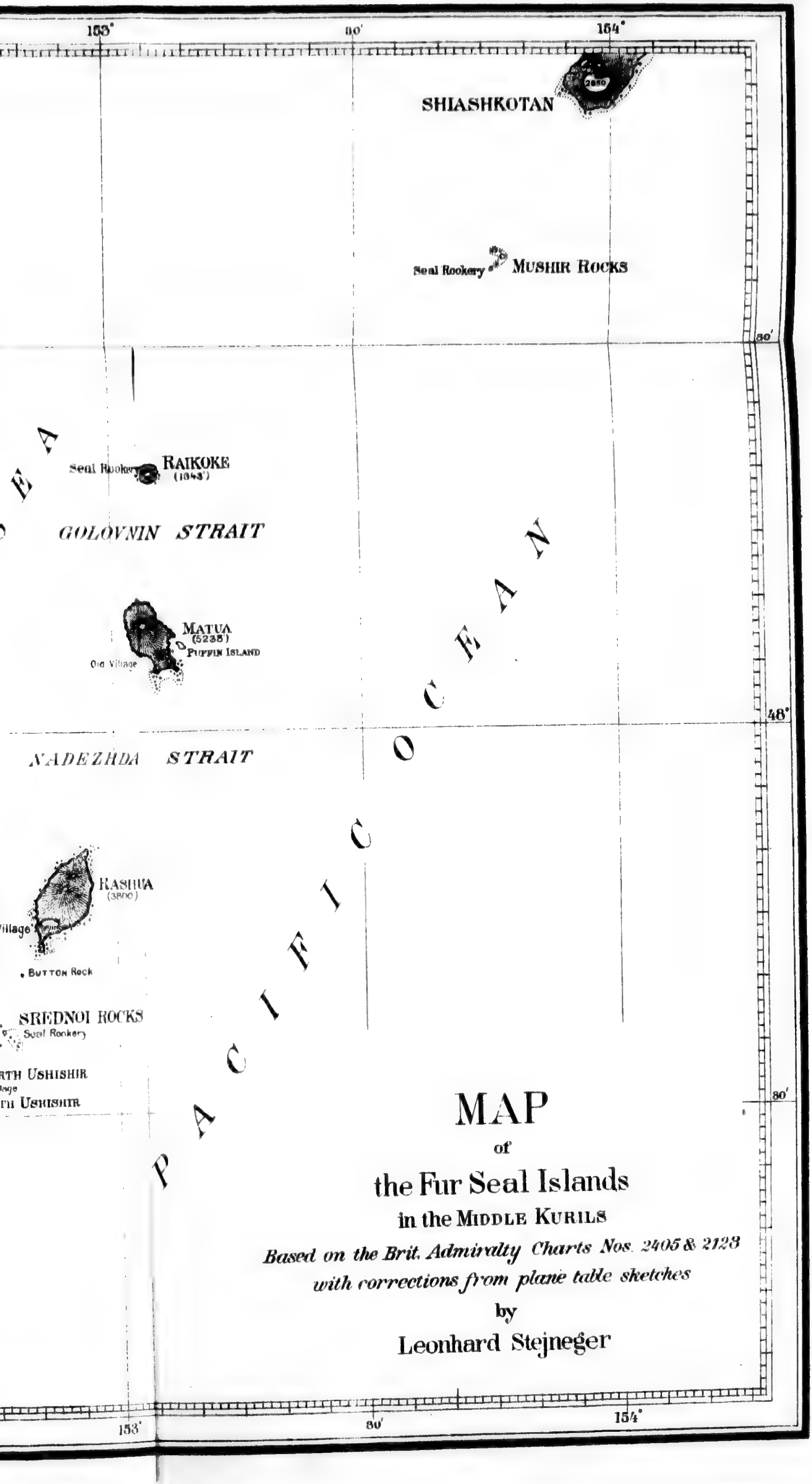


THE KURIL ISLANDS

Based chiefly upon British Admiralty Chart

Nº 2405


152°
30'
153°
PLAN OF RAIKOKE
From Capt H.J.Snow's Sketch
Scale
CABLES 10
5
0
1 MILE
Seal Rookery
Seal Rookery
18
13
14
80'
48
30'
OKHOTSK SEA
Seal Rookery
RAIK
GOLOVNIN ST
MA
Old Village
NADEZHDA ST
RASHUA
(3800)
Old Village
Button Rock
SREDNOI ROCKS
Seal Rookery
NORTH USHISHIR
Old Village
SOUTH USHISHIR
P
KETOI
(3942)
DIANA STRAIT
Broughton Harbor
SIMUSHIR
152°
30'
153°



MAP
of
the Fur Seal Islands
in the MIDDLE KURILS

Based on the Brit. Admiralty Charts Nos. 2405 & 2123
with corrections from plane table sketches

by
Leonhard Stejneger

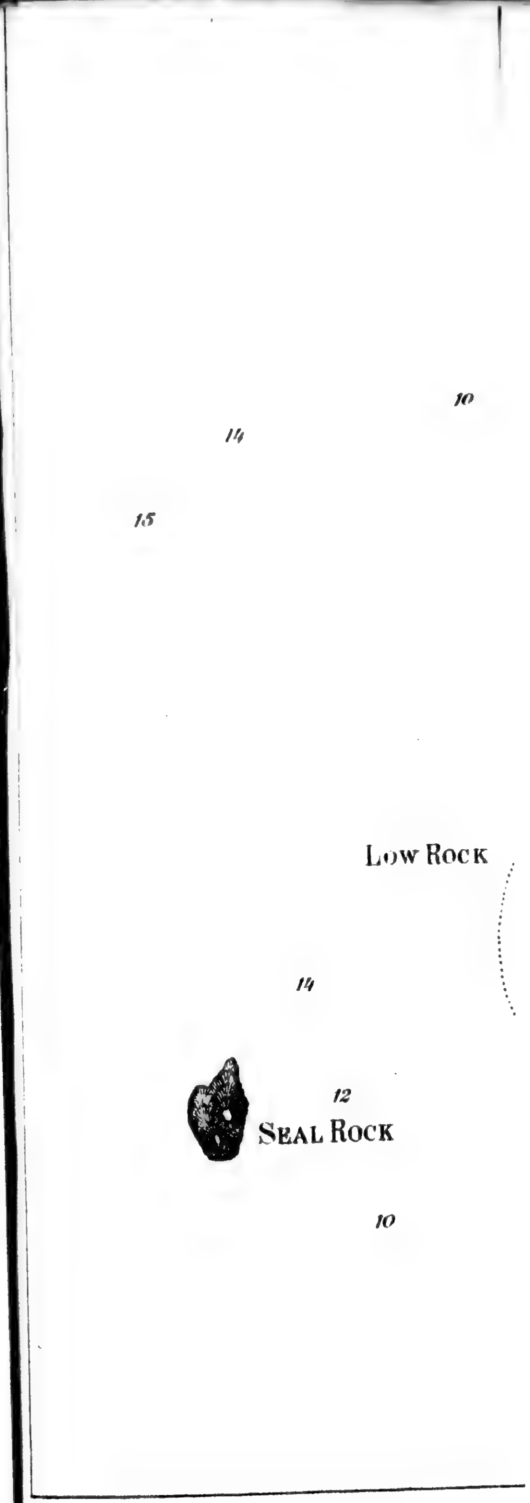
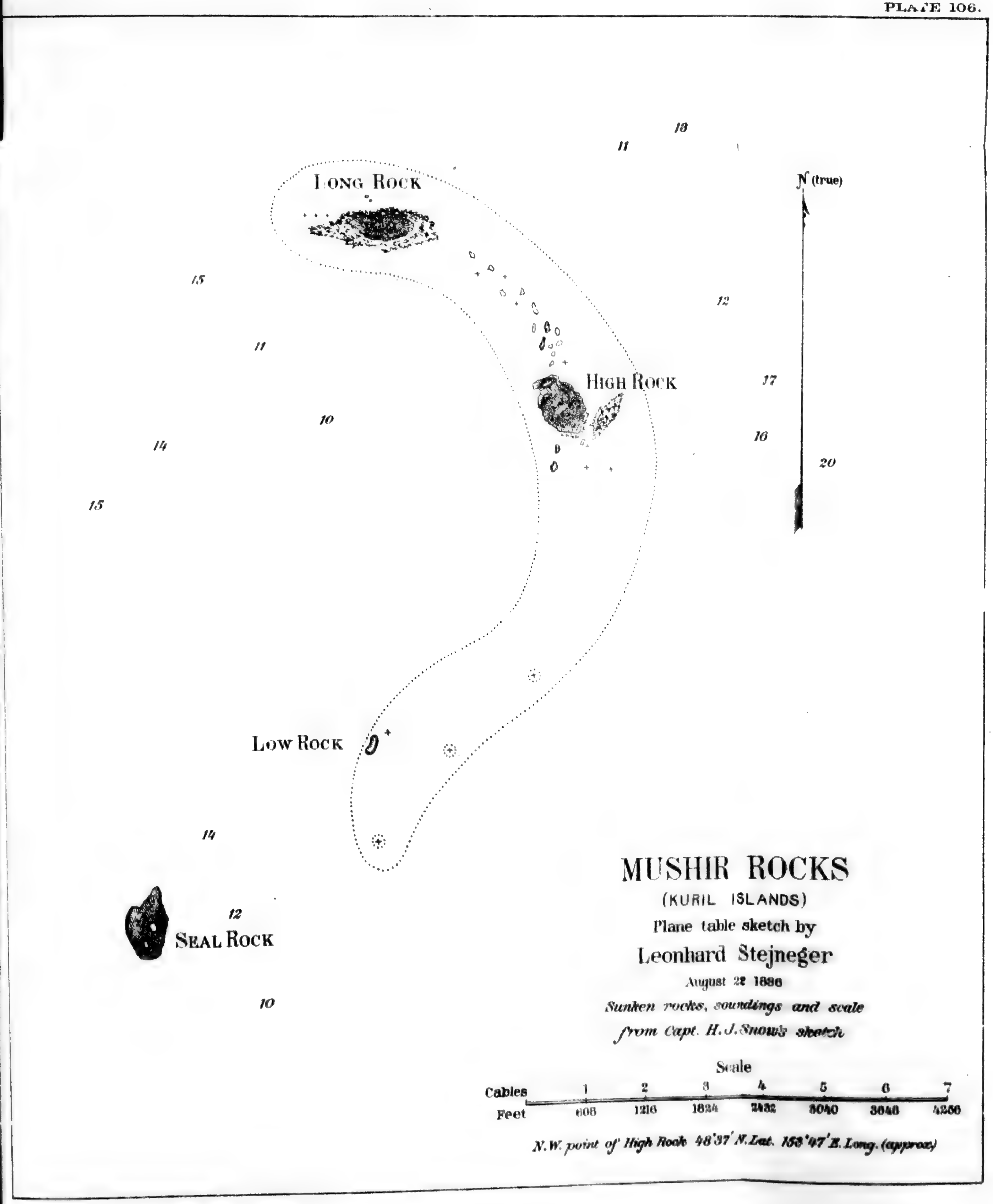

10
14
15
Low Rock
14
12
Seal Rock
10

PLATE 106.



MUSHIR ROCKS

(KURIL ISLANDS)

Plane table sketch by

Leonhard Stejneger

August 22 1896

Sunken rocks, soundings and scale
from Capt. H. J. Snow's sketch

N. W. point of High Rock 48°37′ N. Lat. 153°47′ E. Long. (approx.)

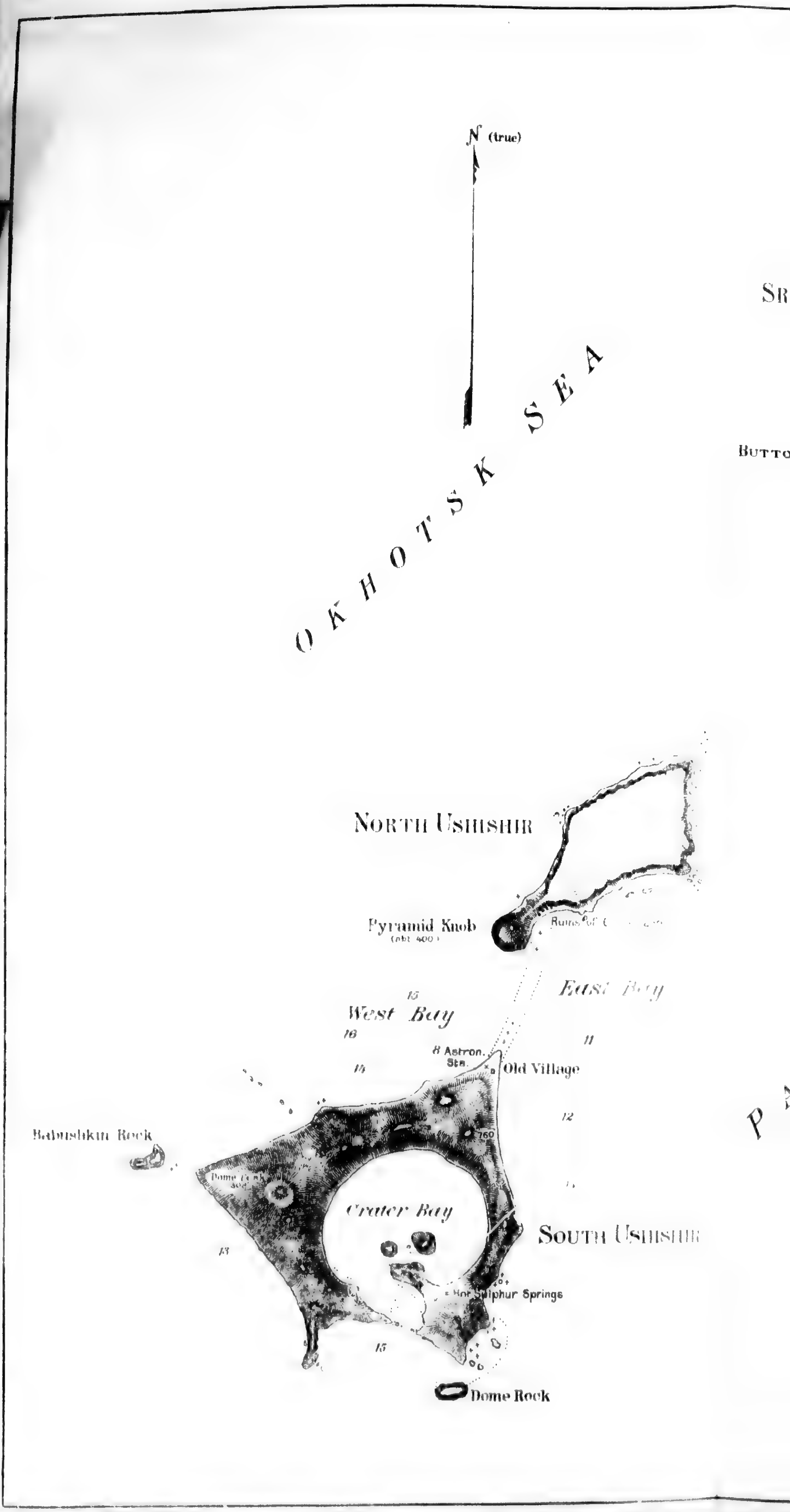
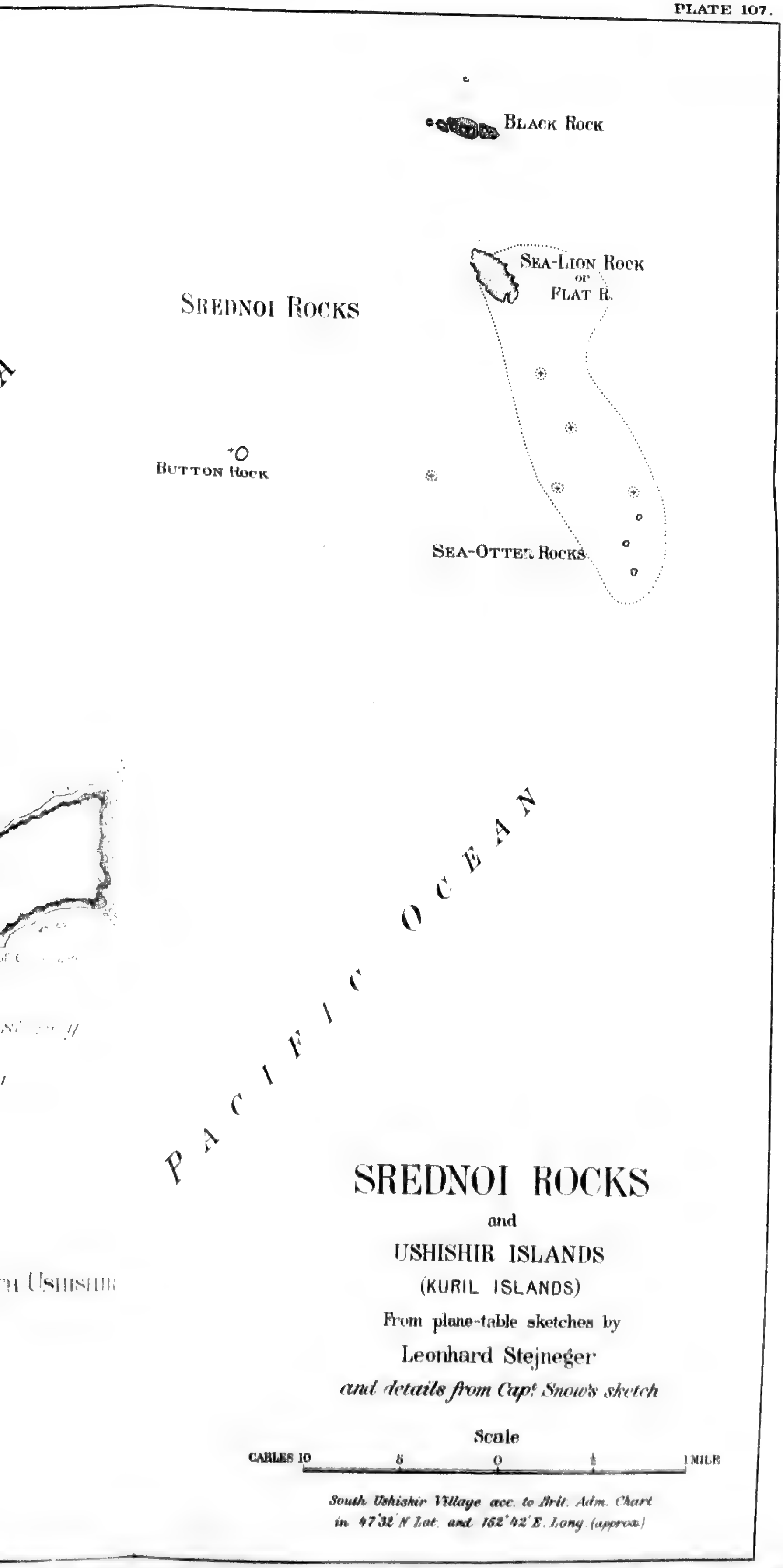

N (true)
OKHOTSK SEA
SR
BUTTO
NORTH USHISHIR
Pyramid Knob
(abt 400)
Ruins of C
East Bay
West Bay
15
16
14
11
8 Astron. Stn.
Old Village
12
Babushkin Rock
760
Dome Peak 500
Crater Bay
SOUTH USHISHIR
13
Hot Sulphur Springs
15
Dome Rock
P

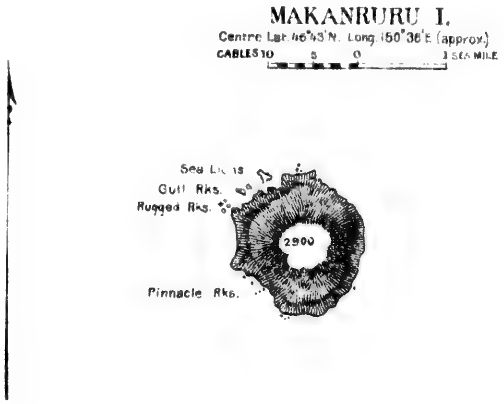
PLATE 107.



SREDNOI ROCKS
and
USHISHIR ISLANDS
(KURIL ISLANDS)

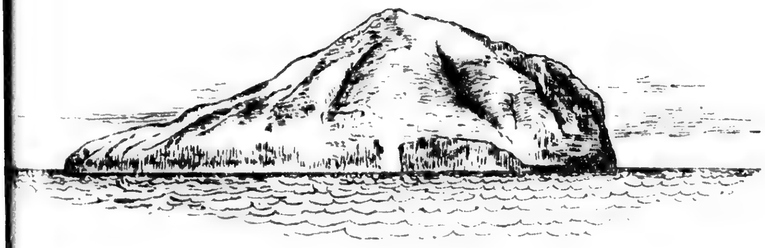
From plane-table sketches by
Leonhard Stejneger
and details from Capt. Snow's sketch

South Ushishir Village acc. to Brit. Adm. Chart
in 47°32′ N Lat. and 152°42′ E. Long. (approx.)



MAKANRURU I.

Centre Lat. 46°43'N. Long. 150°36'E (approx.)

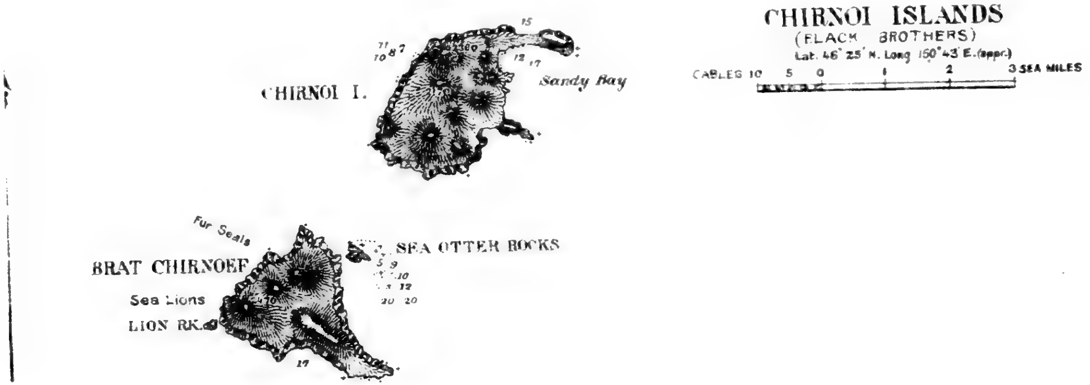


MAKANRURU ISLAND

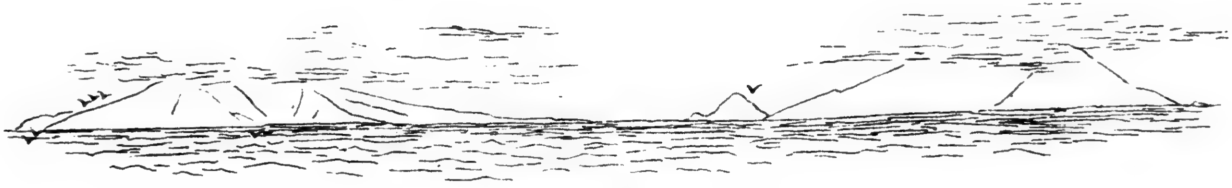
from the South

The plan from Capt. Snow's sketch, Br. Adm. Chart No. 2128
The view from a sketch by Mr. Kitahura

PLATE 109.



CHIRNOI ISLANDS
(BLACK BROTHERS)
Lat. 46° 25′ N. Long. 150° 43′ E. (appr.)



CHIRNOI ISLANDS

✓ Sea Otter Rock ✓✓ Anchorages ✓✓✓ Sandy Bay

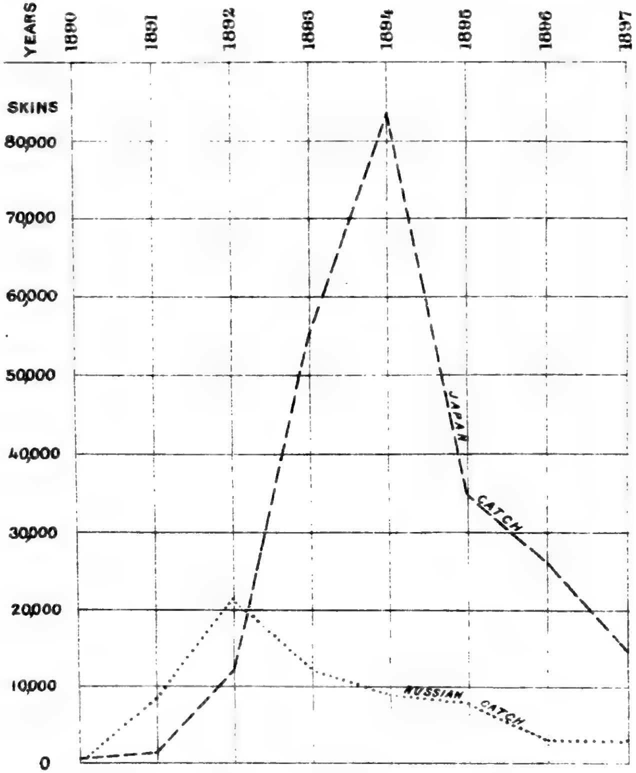
The plan from Capt. Snow's sketch, Br. Adm. Chart. No. 2128. The view from a sketch by Mr Kitahara

View from North West

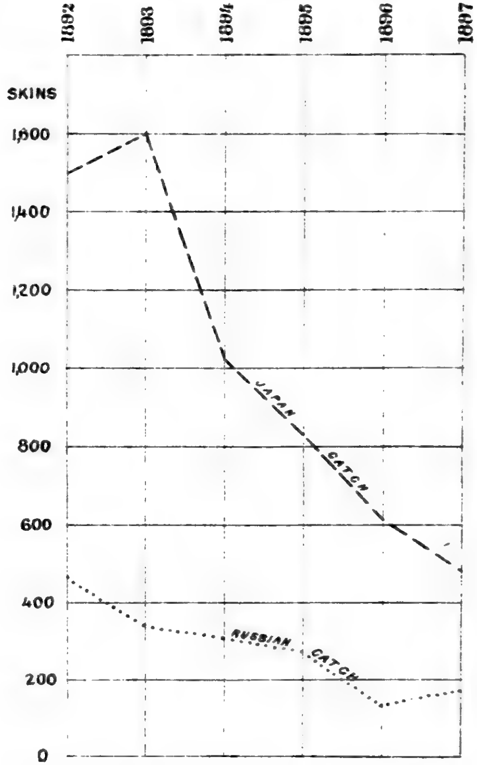
PLATE 110.

PLATE 110.

PELAGIC SEALING IN ASIATIC WATERS



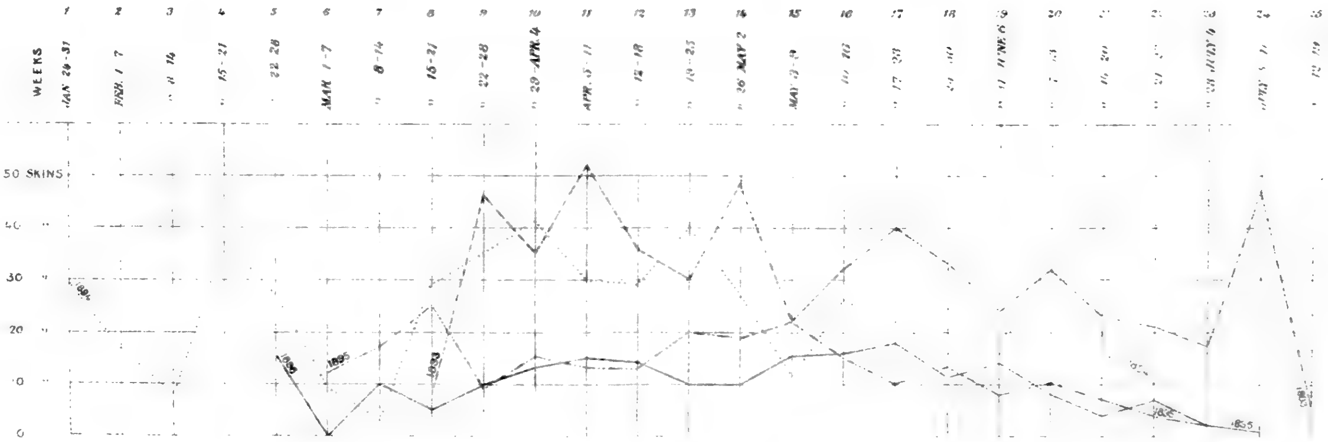
a.= Total number of skins taken yearly, 1890–1897



b = Average catch per vessel yearly, 1892–1897

PLATE III.

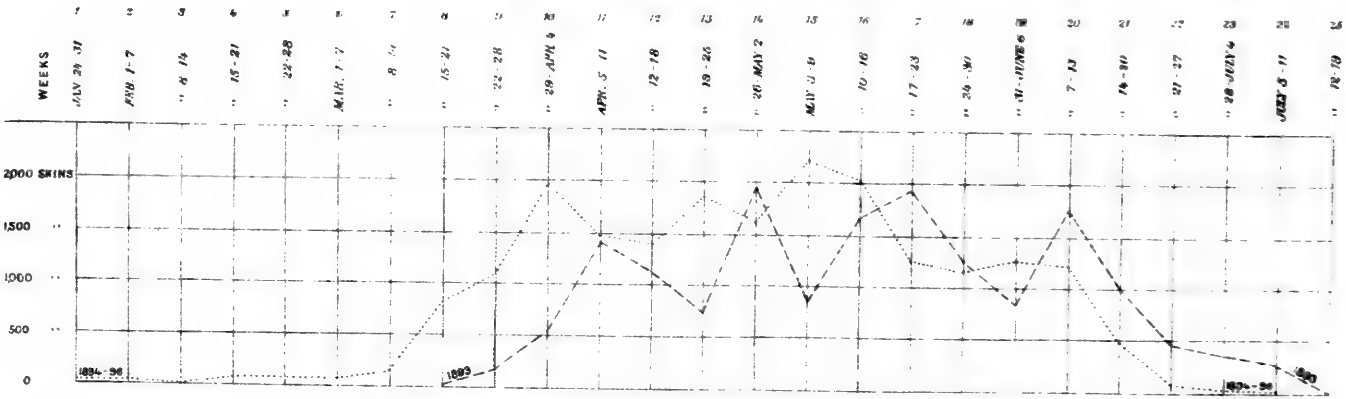
PELAGIC SEALING OFF THE COAST OF JAPAN



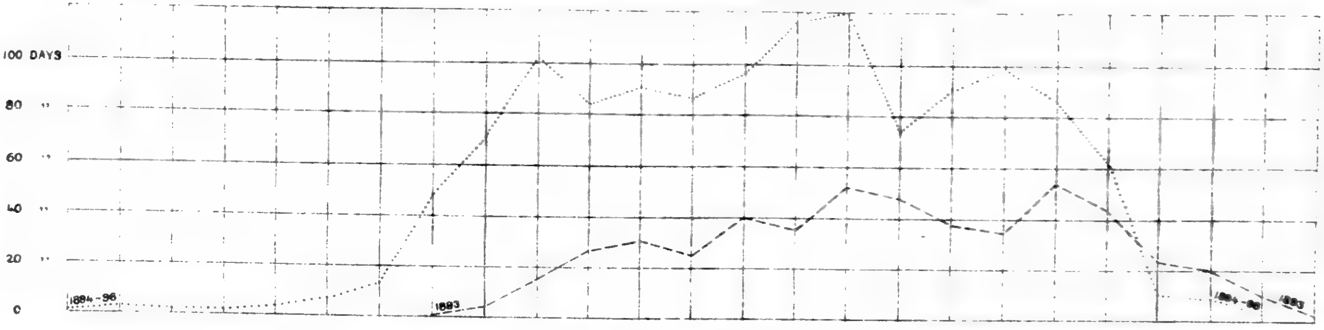
Average catch per hunting day for each week of the spring season, from 189? to 189?.

[illegible]

PELAGIC SEALING OFF THE COAST OF JAPAN



a.– Number of seals taken by 39 schooners during each week of the spring season, 1893 and 1894–1896.



b.– Number of hunting days of 39 schooners during each week of the spring season, 1893 and 1894–1896.

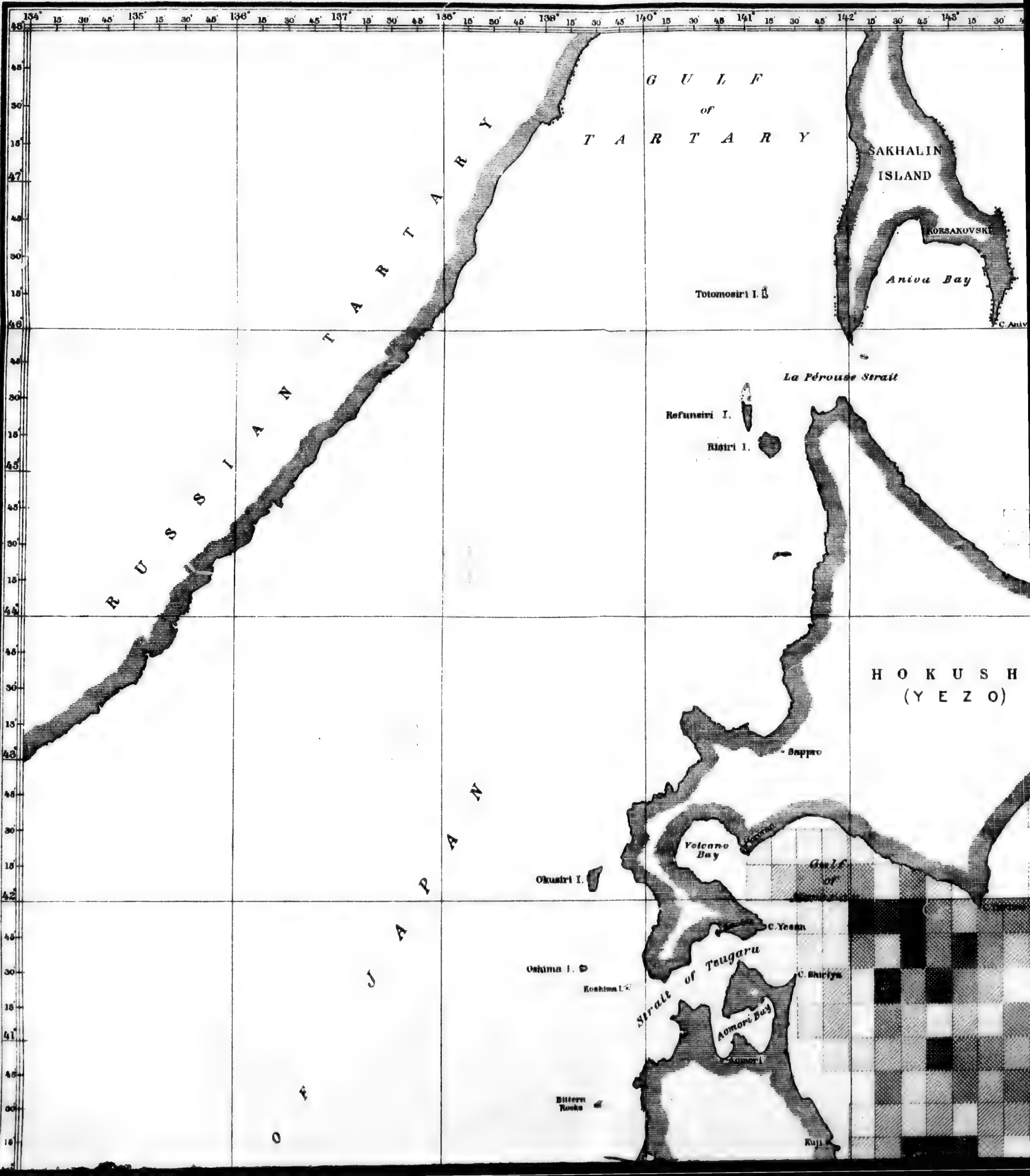
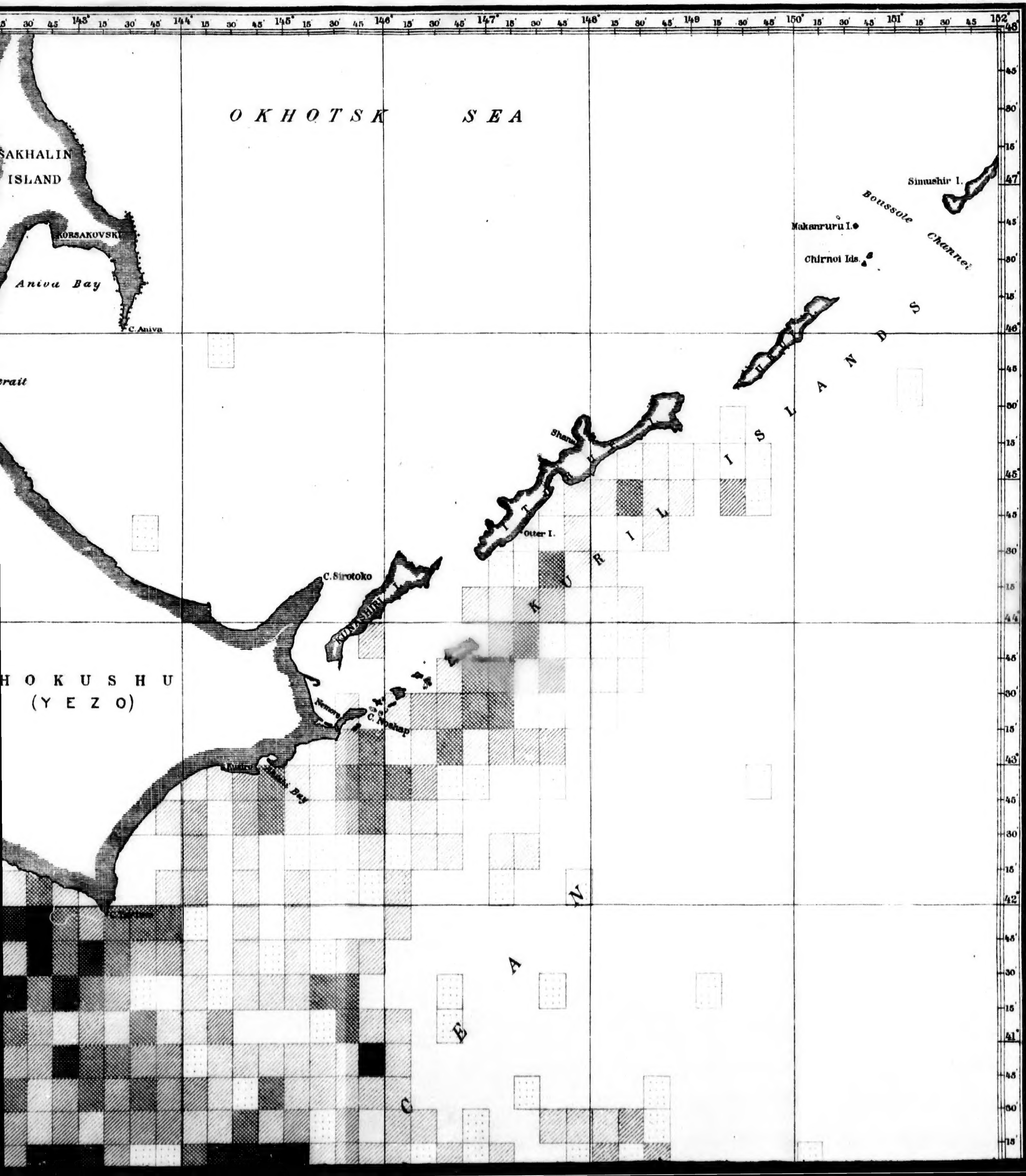
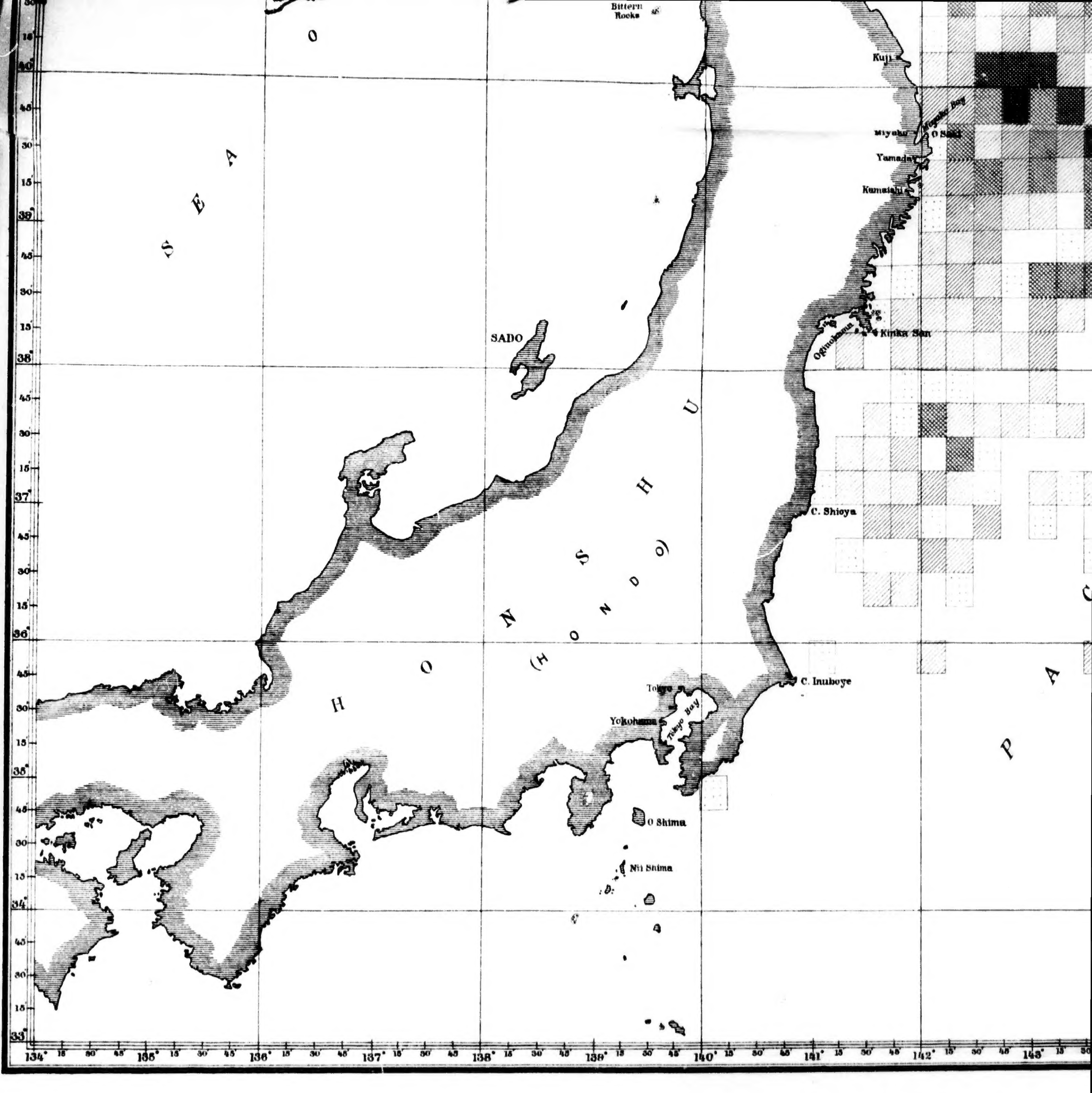
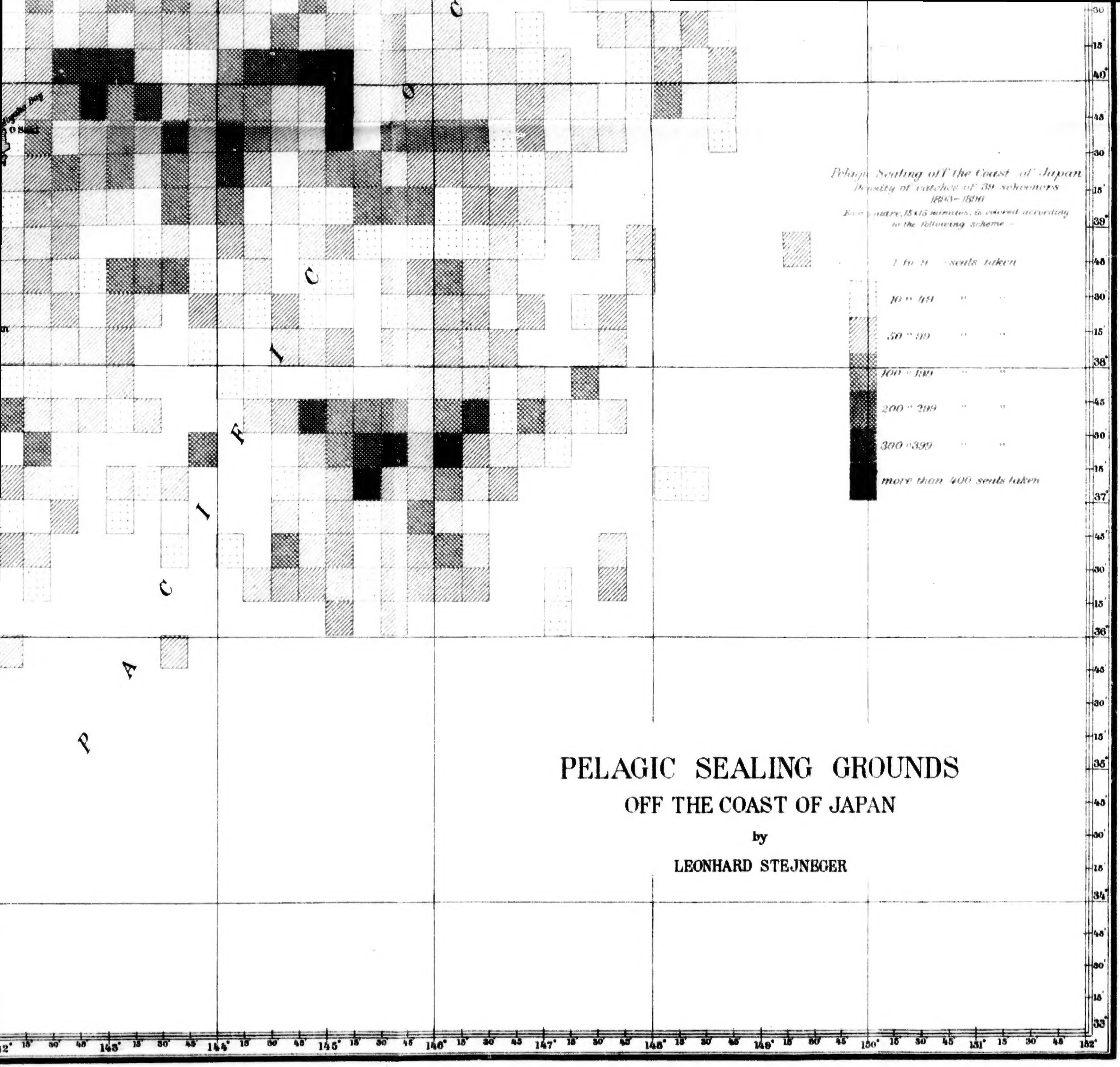

GULF of TARTARY
RUSSIAN TARTARY
SAKHALIN ISLAND
KORSAKOVSK
Aniva Bay
C. Aniv
Totomosiri I.
La Pérouse Strait
Refunsiri I.
Risiri I.
HOKUSH
(YEZO)
Sapporo
Volcano Bay
Gulf of
Okusiri I.
C. Yesan
Oshima I.
Koshima I.
Strait of Tsugaru
C. Shiriya
Aomori Bay
Aomori
Bittern Rocks
Kuji
OF JAPAN
134°
135°
136°
137°
138°
139°
140°
141°
142°
143°
48
47
46
45
44
43
42
41

PLATE 113.


OKHOTSK SEA
SAKHALIN ISLAND
KORSAKOVSK
Aniva Bay
C. Aniva
rait
HOKUSHU (YEZO)
C. Sirotoko
KUNASHIRI I.
Shana
Otter I.
Nemoro
C. Noshap
Kusiro
Bay
KURIL ISLANDS
Simushir I.
Boussole Channel
Makanruru I.
Chirnoi Ids.
C E A N
145°
146°
147°
148°
149
150°
151°
152°
46°
47°
45°
44°
43°
42°
41°


Bittern Rocks
S E A
O
SADO
H O N S H U
(H O N D O)
Kuji
Miyako Bay
Miyako
O Saki
Yamada
Kamaishi
Oginohama
Kinka San
C. Shioya
C. Inuboye
Tokyo
Yokohama
Tokyo Bay
O Shima
Nii Shima
P A C
134°
135°
136°
137°
138°
139°
140°
141°
142°
143°
39°
38°
37°
36°
35°
34°
33°



PELAGIC SEALING GROUNDS

OFF THE COAST OF JAPAN

by

LEONHARD STEJNEGER

The best emigrants for Canada are practical farmers, with capital if possible. In Ontario, which is the best province in the dominion, farms of 100 acres in fair state of cultivation are sold from 2,000 to 5,000 dollars, or £400 to £1,000 sterling. In the northern part of the province, as well as the North-west Territory, there is sufficient good land free to give each family in England 100 acres. No doubt many people will meet disheartening difficulties. In settling as strangers on these new lands I would recommend one or two of a family to come out for a season or two before the large family, and prepare a home for them.

It is only necessary to become acquainted with our country to appreciate it, as I believe no country in the world has been more falsely represented to the English people than Canada. People wondered a few years ago when it was said that wheat would ripen in Manitoba; now it is proved to be the finest wheat-growing country in the world.

From T. S. Sproule, Esq., M.P., North Corkdale, County Grey, Ontario, August 9th, 1883 :—

What are the classes of emigrants required in your constituency?—The most suitable classes would be farm labourers, domestic servants, and tenant farmers, or men with a little money, who could purchase homes for themselves. Mechanics could do well, such as plasterers, bricklayers, and masons.

How many do you think could find employment in your constituency?—From one to two hundred could be placed here.

Are there good chances of success for men with small capital?—Yes, first-rate.

Can farms be rented in your constituency?—Yes, at a rental of from 5s. to £1 an acre for cleared land ; these are good agricultural lands.

Are there improved farms for sale in your constituency?—Yes, a good many. Price, from £2 per acre upwards.

Have you free grant land in your constituency?—No, there is none; it is all settled.

Is it possible for English, Scotch, Welsh, or Irish agricultural labourers to obtain farms on the principle of sharing crops (or otherwise) with the owner, with the man doing the labour? I understand that the labourer must have obtained Canadian experience before attempting such an undertaking.—Yes, after the party has had some experience in the country. It is done to quite an extent now, and is profitable to both parties.

Are domestic servants required in your part of the country?—Yes, very much ; it is very difficult to get them now.

How many domestic servants do you think could obtain situations in your part of the country?—It would not be difficult to place from 100 to 200 in this constituency.

Remarks.—Farm labourers and domestic servants are very much needed in this locality, and some hundreds could find profitable employment at good wages. It is almost impossible to get labourers, as it is so easy for them to get farms in Manitoba and the north-west that most of the young people as soon as they come of age get married, and settle down on a farm for themselves.

This is a first-class agricultural country, in which all kinds of grain-growing and cattle-raising can be carried on profitably. It is rolling land, very healthy, and a pleasant place to live—churches, schools, and post-offices convenient in almost every locality. Farms can be bought very cheaply, I mean cleared and cultivated farms with good buildings on, as many of the older settlers sell out, and move into the newer country after their sons and daughters. English, Irish, Scotch, and Welsh do well here, and can find plenty of their own nationality settled in every neighbourhood here, and doing well. Wishing you every success in your commendable work,

Yours truly, T. S. Sproule.